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January 1992

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U.S., Canadian companies look for full recovery by 1993 52, 65

Continued downturn forces more cutbacks in capital spending 89

CPFP expands at Thunder Bay, Ont. 117

Volume 66
Number 1

JANUARY

THE COVER

This issue's Outlook '92 (p. 52) and Capital Spending (p. 89) reports analyze the beginnings of a turnaround for both U.S. and Canadian paper industries. However, the recovery is expected to be slow through 1992 without a full recovery until 1993. (Photo courtesy of Georgia-Pacific Corp., all rights reserved)

FOCUS: OUTLOOK '92

Recovery is coming 52
U.S. pulp and paper producers will begin to benefit this year from an economic upturn but are unlikely to return to full operating rates and significant earnings increases until 1993 when consumer spending and the service sector rebound

- Long-term outlook 55
- Uncoated free-sheet 56
- Coated paper 56
- Tissue 57
- Containerboard 57
- Boxboard 58
- Wastepaper 58
- Pulpwood 60

Softness lingers in Canada 65
Despite the apparent end of recession, Canadian mills face another year of bottom-line losses (some are comparing them to the Great Depression) and capacity shutdowns, especially for export-driven companies

- Newsprint 66
- Uncoated groundwood 68
- Market pulp 68

Labor 69
Canadian labor and management again bargain under the onus of weak pulp and newsprint markets when contracts expire in April

Environment 71
Regulations continue to saddle mills with environmental expenses topping $1 billion annually; emphasis is on water quality and chlorine reduction

CAPITAL SPENDING

P&P's annual survey 89
Companies will continue to scale back capital spending in 1992 in the face of renewed uncertainty about the prospects for recovery

FEATURES

PAPERMAKING

Slitter management at Mead 84
Mead Paper's Chillicothe, Ohio, coated paper mill improves winder operations with extensive slitter management program

EXPANSION/MODERNIZATION

Slave Lake Pulp 108
Environmental awareness and quality enhancement quide the first year of BCTMP production at Slave Lake Pulp Corp.'s Alberta mill

CPFP expansion 117
Canadian Pacific Forest Products brings new newsprint machine, recycled fiber line, and TMP plant online at its Thunder Bay, Ont., mill

PULPING

Bleaching deinked stocks 79
Part two of this three-part article examines bleaching agents and process stage setups necessary for wood-containing furnishes

PROCESS CONTROL

Production management 106
Alberta Newsprint Co. uses advanced production management system at its $380-million, 220,000-metric-tpy mill at Whitecourt, Alta.

POWER/STEAM

Blandin boiler cleaning 120
Blandin Paper's Grand Rapids, Minn., mill reduces possibility of power boiler overheating, corrosion with chemical cleaning

MANAGEMENT

Mobile technology show 99
Special spring tour will bring a broad spectrum of pulping and papermaking technology directly to the doorsteps of selected mills

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JANUARY

COLUMNS

From the Editors 9
by Robert Galin
Environmentalists no longer fringe lunatics

Recycling Update 39
by Andy Harrison
Chelating agents

Career Development 41
by Roberta Bhasin
"Have you heard . . . ?"

Maintenance Management 43
by Christer Idhammar
Planning and scheduling performance

Comment 162
by Mark Massara
Surfers and Pulp Mills

DEPARTMENTS

Conference Calendar 45
News of People 125
Product Showcase 132
New Products 134
Product Review 137
Bookshelf 139
Supplier News 141

SERVICES

Reader Service Review 128
Reader Service Card 129
Professional Service Directory 152
Classified Advertising 154
Advertisers Index 160

NEWS

Month in Statistics 11
U.S. paper and paperboard production data for September

Market Report 13
Free-sheet pricing "horrendous"
G-P announces southern pulp hike
Wastepaper market remains stable

Grade Profile 15
Kraft linerboard: High operating rates if U.S. economy begins to strengthen

NEWS SCAN

Champion's Courtland project 25
Stone to restructure Wayagamack 27
Westvaco loses in IP patent suit 27
Producers await dumping ruling 27
States' water regulations 31
CP to spend $118 million 31
Plastic envelopes set for growth 31
Pulp producers take mills down 33
Newsprint makers take break 33
Kraft shutdowns announced 35
Safety violations at IP 35
Chemical prices steady 35
Appleton to add thermal capacity 35

International News 37
IP moves buying binge to Pacific
Swedish profits drop
Scott sells Japan venture to partner

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ABP

BPA

U.S. paper and board production

U.S. production of paper and paperboard totaled 6.6 million tons in September, up 1.8% from the previous year, according to the American Paper Institute (API). The seasonally adjusted rate of production stood at 78.8 million tpy through the first nine months, up 0.5% from the same period in 1990. Paperboard production climbed 1.7% to a 39.8 million tpy rate, while paper output dropped 0.7% to 39.0 million tpy. The third quarter was strong for both sectors, helping to offset weakness early in the year for the paper grades and during the summer for paperboard.

Among major grades, printing and writing papers showed no change from 1990, as recent strengthening has not yet offset a poor showing in the first quarter. API points out that new orders have exceeded shipments since April, however, and that unfilled orders for uncoated free-sheet have increased sharply. Exports continued to buoy the linerboard sector, rising 18.3% above 1990. Production for the domestic market was up 2.2% in the third quarter, but only 0.6% through September.

Canadian newsprint shipments totaled 698,000 metric tons in September, unchanged from a year earlier, while market pulp shipments rose 11.1% to 642,000 tons. Operating rates dropped to 88% at newsprint mills and 75% at pulp plants for the first nine months. ■

	Latest month (000 short tons)		% change from year ago	Annualized year-to-date (000 short tons)	% change from year ago
PAPER & PAPERBOARD PRODUCTION[1]					
Newsprint	Sept.	547	-0.4	6,791	3.7
Uncoated groundwood (s)	Sept.	155	13.1	1,772	-0.2
Coated paper (s)	Sept.	637	0.2	7,264	-3.3
Uncoated free-sheet (s)	Sept.	981	5.7	11,491	0.0
Other printing/writing	Sept.	127	-3.1	1,477	-6.5
Total packaging and other paper (s)	Sept.	356	-7.0	4,465	-2.4
Tissue	Sept.	465	-4.5	5,681	-1.7
Total paper	**Sept.**	**3,267**	**0.5**	**38,940**	**-0.7**
Unbleached kraft paperboard	Sept.	1,768	4.0	20,714	2.8
Semichemical medium	Sept.	461	1.3	5,655	-0.4
Bleached paperboard	Sept.	368	1.4	4,595	3.1
Recycled paperboard	Sept.	758	2.6	8,984	-0.2
Total paperboard	**Sept.**	**3,356**	**3.0**	**39,948**	**1.7**
Total U.S. paper and paperboard output	**Sept.**	**6,623**	**1.8**	**78,888**	**0.5**
PULP, WASTEPAPER & FIBER[2]					
Total U.S. woodpulp production	Aug.	5,133	-4.3	63,594	1.2
Market pulp production	Aug.	688	-15.9	9,000	1.3
Wastepaper consumption at paper/board mills	Aug.	1,854	0.5	21,624	3.2
Pulpwood consumption (cords)	Aug.	8,419	1.0	99,159	-0.2
CONVERTED PRODUCTS STATISTICS[3]					
Corrugated box shipments (billion ft²)	Sept.	31.334	1.9	271.378[6]	0.0
Containerboard inventories at U.S. box plants and mills	Aug. 31	2,539	-1.2		
INTERNATIONAL TRADE[2]					
U.S. paper imports (including products)	Aug.	1,005	-7.7	12,045	-8.9
Imports of Canadian newsprint	Aug.	606	-9.7	7,621[6]	-10.5
U.S. paper exports (including products)	Aug.	746	23.7	8,297	21.3
Exports of unbleached kraft linerboard	Aug.	258	12.2	3,044	12.9
Exports of woodpulp	Aug.	565	2.0	6,534	8.9
Norscan pulp inventories[4]	Sept. 30	1,469	-1.7		
Norscan pulp operating rates[4]	Sept.	74%	89%	84%	86%
CANADIAN STATISTICS[5] *(reported in metric tons)*					
Total newsprint shipments	Sept.	698	0.0	6,497[6]	-6.3
Operating rates	Sept.	86%	77%	88%	92%
Inventories held by U.S. consumers	Sept. 30	1,411	6.4		
Other paper/board shipments	Sept.	642	11.1	5,514	-0.8
Woodpulp shipments (export only)	Sept.	766	23.9	6,280	11.1
Operating rates	Sept.	75%	87%	75%	87%

1. American Paper Institute. 2. API, Bureau of Census, American Pulpwood Assn. 3. Fibre Box Assn.; Paperboard Packaging Council. 4. North American/Scandinavian paper-grade market pulp. 5. Canadian Pulp & Paper Assn. 6. Not annualized. (s) = Shipments.

Kraft linerboard: High operating rates if U.S. economy begins to strengthen

Grade structure: Unbleached kraft linerboard is made in a wide range of basis weights. Standard weight in the U.S. is 42 lb/1,000 ft^2, but other important weights are 26 lb, 33 lb, 69 lb, and 90 lb/1,000 ft^2. Major end use is in domestic corrugated container production, although about 15% of output is exported.

Regular unbleached kraft accounts for the bulk of U.S. linerboard production, but white-surface, high-performance and recycled grades have been showing faster growth. White-surface linerboard output last year totaled more than 1.3 million tons and has been growing about 7%/year. Recycled linerboard production last year was about 600,000 tons but is expected to more than double over the next several years due to increased interest in recycling. High-performance grades are being spurred by changes in Rule 41 freight classifications and need for boxes offering higher compression strength.

Production: U.S. linerboard production held up well through last year's economic downturn thanks to strong export demand. Linerboard production for the domestic corrugated box market was down about 1% due to almost no growth in corrugated box shipments. But exports surged about 18% to nearly 3 million tons, an all-time high, according to American Paper Institute (API) statistics. For all of 1991, linerboard output will increase an estimated 1.3% to a record 19.2 million tons. Linerboard mills' operating rates for the year averaged about 96%—not bad for a recession year.

Containerboard inventories at box plants and mills dropped from a peak of 3.1 million tons (6.7 weeks) at the end of February 1991 to 2.46 million tons at the end of October (4.8 weeks)—a decline of 645,000 tons. Although expected to rise with the normal slowdown in box plant activity in December, inventories will start the new year considerably below their level at the beginning of 1991.

Capacity trends: Linerboard capacity will show only modest growth over the next several years, according to the new API capacity survey released in December. Kraft linerboard capacity is expected to increase only 1.6% in 1992 following 1.2% growth in 1991 and will show no increase in 1993.

Recycled linerboard capacity, however, is expected to show more dramatic growth, rising from 673,000 tons in 1991 to 848,000 tons in 1992 and 1.45 million tons by 1993. With the inclusion of recycled capacity, total U.S. linerboard capacity is expected to rise 2.1% in 1991, 2.4% in 1992, and 2.9% in 1993.

Outlook: With any growth in corrugated box shipments and limited growth in new capacity, linerboard producers will enjoy relatively high operating rates in 1992. Corrugated box shipments are only projected to grow about 3.5% this year in what is expected to be a slower than normal economic recovery. Meanwhile, U.S. linerboard export shipments are expected to show about 4% growth, with increased demand from Asia and Latin America offsetting any dropoff in orders from Europe.

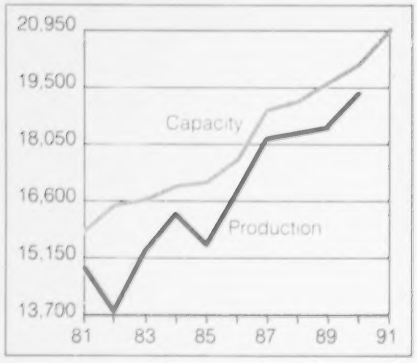
Total U.S. kraft linerboard production is expected to increase 3.6% to a record 19.9 million tons. This would result in operating rates of 97-98% for kraft linerboard mills (or 96-97% if recycled mills are included).

Prices: Improving market conditions enabled linerboard producers to push through a $30/ton price increase last fall bringing the transaction price in the eastern U.S. to $350/short ton. This reversed a nearly two-year slide in prices from the former list of $410, first established in the spring of 1988.

Some producers may try to get the price back up to the former list level with a $30/ton price increase this spring, followed by another $30/ton increase in the fall. Sluggish U.S. economic conditions and some possible weakening in export markets, however, make success of a spring increase uncertain.

Historical year-end transaction prices for 42-lb linerboard delivered in the eastern U.S. (before zoned rebates) were as follows: 1991, $350/short ton; 1990, $360; 1989, $390; 1988, $410; 1987, $380; 1986, $320; 1985, $260. ■

SUPPLY/DEMAND (000 tons)



FORECAST (000 tons)

U.S.	1990	1991e	1992e
Production[1]	18,935	19,185	19,880
Capacity[1,2]	19,743	19,989	20,309
Utilization rate	95.9%	96.0%	97.9%
Imports[1]	114	91	100
Exports	2,520	2,970	3,100
Apparent U.S. consumption	16,529	16,306	16,880
–lb/capita	132.8	129.8	132.8
GNP ratio[4]	3.98	3.93	3.96

1. Kraft linerboard—excludes recycled. 2. Based on 1991 API capacity survey. 3. Dept. of Commerce. 4. 000 tons/ billions $ real GNP.

TOP U.S. PRODUCERS (000 tpy)

	Annual capacity	Market share (%)
1. Stone Container	2,925[1]	13.8
2. Georgia-Pacific	2,225	10.5
3. International Paper	1,760	8.3
4. Jefferson Smurfit/CCA	1,610	7.6
5. Union Camp	1,600[2]	7.5
6. Temple-Inland	1,525	7.2
7. Weyerhaeuser	1,500	7.0
8. Gaylord Container	1,225[3]	5.8
9. Packaging Corp.	1,160[4]	5.5
10. Willamette Industries	900	4.3

Market share of top five companies:
47.8%
Market share of top ten companies:
77.7%
Total U.S. capacity (kraft and recycled) 1992:
21,157

1. Includes all of 85%-owned Seminole Kraft Corp. (350,000 tpy) but excludes Canadian operations (216,000 tpy).
2. Includes net capacity from new Savannah, Ga., machine.
3. Reflects shutdown of kraft linerboard machine at Antioch, Calif., mill.
4. Includes Valdosta, Ga., mill (395,000 tpy) acquired from Georgia-Pacific in early 1991.

Planning and scheduling performance

In a previous column, it was suggested that you should rate your area planning and scheduling performance for daily maintenance and shutdown maintenance according to the three following categories:

- planned and scheduled maintenance
- only scheduled, not planned maintenance
- break-in work.

Average results of studies of four tissue mills, five pulp mills, two newsprint mills, and three fine paper mills since April 1991, are shown in the graphs below. It might be interesting to compare your planning and scheduling performance with the results shown. I would be surprised if your situation did not fit a similar pattern.

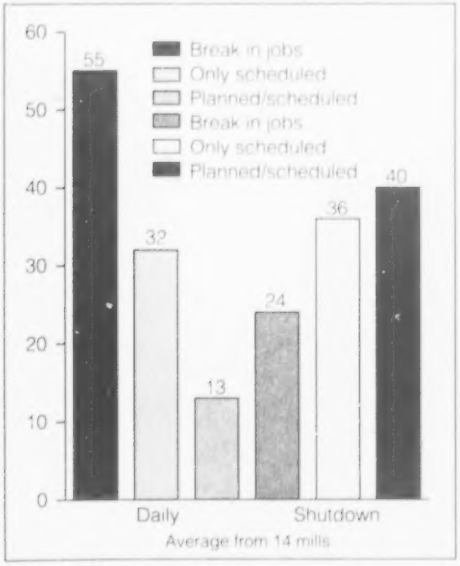
All mills included in the study are considered average in equipment efficiencies, appearance, and maintenance performance. Data does not vary much between mills. In summary, daily maintenance planning and scheduling performance is the opposite of shutdown maintenance planning and scheduling performance. Break-in jobs are 55% for daily maintenance and 24% for shutdown maintenance. Thirty-two percent of daily maintenance is performed as scheduled, but not planned—for shutdown maintenance, this figure is 36%. Only 13% of daily maintenance is planned and performed according to schedule. Forty percent of shutdown maintenance is planned and performed according to schedule. This data is based on studies and interviews with operations and maintenance personnel at all levels in the organization and is believed to be as accurate as possible.

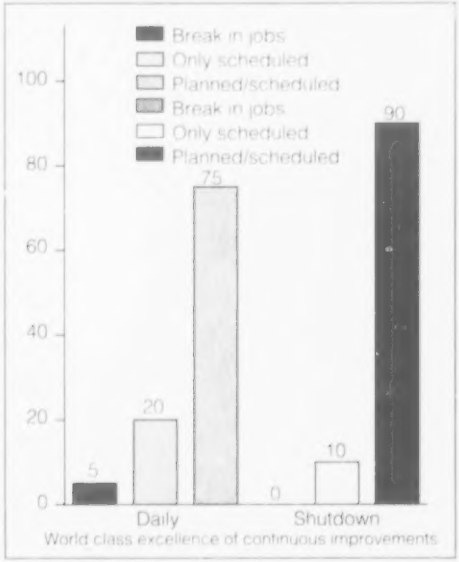
When using information only from planners and their managers, the picture is quite different, as they do not always differentiate between planning and scheduling. The planners and their managers might report to upper management that 80% of all maintenance is "planned." Often, no further analysis is done to find out what this figure really means and everyone's satisfied.

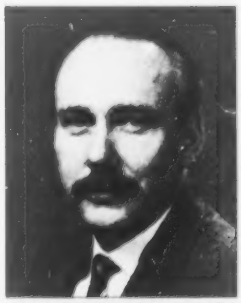
However, you might not see any results in increased production and lowered costs. If you scrutinize your planning and scheduling performance and truly improve it, results will be generated. To generate real results will take more than only planning and scheduling. Because people will get more done in less time, the released resources need to be managed in such a way that real savings are achieved. For example, change your focus toward Design Out Maintenance or Continuous Improvement and, if necessary, attrition over a number of years.

For comparison, I consider World Class Planning and Scheduling Performance to be represented in the following graph.

Note: Examples in this column do not include maintenance of electronic equipment.







CHRISTER IDHAMMAR *is president and chief operating officer of IDCON Inc., maintenance management consultants, Raleigh, N.C.*

U.S. Paper Industry Will Benefit from Economic Revival This Year

But operating rates and earnings will remain depressed until full recovery is achieved in 1993

The U.S. paper industry is set to benefit from a sustained recovery in the U.S. economy, which should begin this year. However, the recession's effects will carry over into 1992, and industry earnings and operating rates will not truly recover until 1993. Paper company executives and financial analysts surveyed by *Pulp & Paper* say the key to a strong recovery in this very competitive industry is a healthy increase in consumer spending and an improvement in the service sector of the economy.

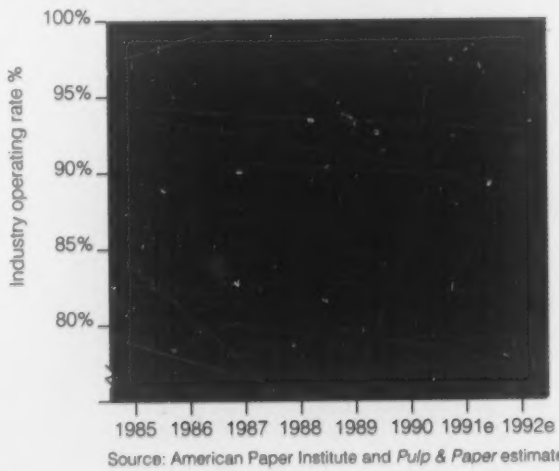
There is general agreement that the U.S. recession has ended, as inflation and interest rates have dropped, but unemployment in some sectors of the economy remains high. Continued weakness in advertising, finance, real estate, and white-collar employment in general has sharply reduced demand for communications grades of paper. The manufacturing sector of the economy has fared somewhat better, and this, in turn, explains the favorable demand for linerboard and corrugated boxes. In addition, market pulp prices have shown recent evidence of improvement, but prices remain deeply discounted.

Most analysts believe that the industry will enjoy a recovery similar to past industry cycles, but timing is a critical variable. Lawrence Ross of Paine Webber thinks that the rate of economic recovery will be substantially lower and different from previous cycles because the paper industry had a much larger capacity expansion in 1989-91 than in previous periods. As a result, the decline in prices and operating rates in some sectors of the industry were more severe than expected. This means there will be a longer waiting period until discounting is reversed and prices regain previous peaks.

The 1992 recovery is unlikely to feature sharp industry price gains, according to Evadna Lynn of Dean Witter. "A muted economic recovery combined with a capacity surplus in many grades will result in a sustained period of 89% to 91% operating rates for paper grades—a pattern not seen since the 1960s, when price hikes were sporadic," said Lynn. Historically, upward price movements have not been supported until operating rates reached 93%.

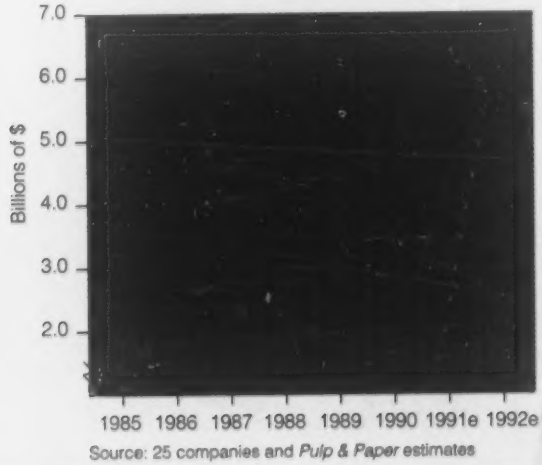
Outlook 1992 was prepared by Pulp & Paper *news editors Will Mies, Debra Garcia, Noel DeKing, Robert Galin, Sophie Wilkinson, Mark Weintraub, and Jim McLaren.*

Operating rates will remain depressed at U.S. paper and board mills...



Source: American Paper Institute and *Pulp & Paper* estimates

... and so will profits!



Source: 25 companies and *Pulp & Paper* estimates

TABLE 1: **Analyst's projections for 1992 (percentage change from 1991 levels).**

	Growth in real GNP	Production Paper	Production Board	Operating rates[1] Paper	Operating rates[1] Board	Prices Paper	Prices Board	Unit costs[2]	Earnings Paper	Earnings Forest	Housing starts[3]
Tom Clephane **Jeanne Carroll** Morgan Stanley	3.0%	4.0%	3.3%	90.3%	93.4%	5.5%	8.7%	4.0%	45%	25%	1.28
Evadna Lynn Dean Witter Reynolds	2.5	3.6	1.5	90.0	91.9	(1.0)	5.0	0.4	18	50	1.15
Lawrence Ross Paine Webber	2.5	5.0	4.0	91.0	94.0	5.0	5.0	3.0	39	300	1.25
William Wigder First Boston	2.5	3.7	3.0	90.5	93.2	7.0	3.0	3.5	25	75	1.10
Sherman Chao Salomon Brothers	2.2	3.7	2.1	89.5	92.8	(1.0)	8.0	3.0	10	55	1.20
Gary Palmero Oppenheimer & Co.	2.6	3.3	4.1	90.2	93.8	6.5	11.0	4.6	23	55	1.28
Chad Brown Merrill Lynch	2.1	3.7	2.2	91.0	93.0	(0.1)	7.0	1.0	17	100	1.15
Mark Diverio Shearson Lehman	3.1	3.2	2.9	91.2	93.8	4.2	8.5	3.2	60	70	1.26
Chip Dillon First Manhattan	2.0	4.1	1.8	91.7	95.8	2.0	7.0	3.0	70	94	1.15
Average	**2.5%**	**3.8%**	**2.8%**	**90.8%**	**93.5%**	**3.1%**	**7.0%**	**2.9%**	**34%**	**92%**	**1.20**

( ) represents a negative figure, n.a. = not available.
1. Production as percent of capacity. 2. Costs/ton of output. 3. Millions of units.
Source: *Pulp & Paper* survey.

RECOVERY WILL BE GRADUAL. The paper industry has displayed varied signs of improvement in recent months, but virtually all of the analysts who cover the paper and forest products industry have lowered their 1992 earnings estimates. This is based on lower projections for GNP growth in fourth-quarter 1991 and only a 2.5% forecast rise in real GNP in 1992. There is also concern that the U.S. economy may fall briefly into a "double-dip" recession this year. U.S. paper industry volume grows with GNP, and the first year of an industry earnings recovery is typically the slowest of the cycle, followed by larger gains during the second and third years of an economic expansion.

Due to the lower output of the U.S. economy in 1991, domestic consumption of paper and paperboard declined about 2% last year. However, U.S. production remained stable because of rising exports. Exports of paper and board increased more than 15% in 1991, and market pulp exports advanced about 10%, while imports declined slightly. George Adler of Smith Barney, Harris Upham & Co. predicts that U.S. producers are likely to gain additional sales in world markets as long as the dollar stays down, and this should contribute to higher industry output in 1992. U.S. mills have a substantial cost advantage in relation to most foreign competitors, so incremental supplies are likely to come from the U.S. Indeed, exports will continue to grow faster than the domestic market this year.

But higher levels of exports must be matched by higher product prices for earnings to show a strong recovery. Linerboard and market pulp are important exports for U.S. mills, but these grades have seen 15% to 35% declines, respectively, in world prices over the last two years. Profit margins for linerboard and pulp dropped to zero, although the U.S. economy was down only about 0.5% in real GNP. "The U.S. industry is perfectly capable of destroying its own earnings power while being the world's low-cost producer of these products," comments Lawrence Ross of Paine Webber.

EXCESS CAPACITY? The U.S. industry added an estimated 2.5 million tons of additional production capacity for paper and board in 1991, marking the highest annual volume increase in history. Another 2.0 million tons of new capacity is scheduled to be brought online this year. This enormous capacity growth has upset the balance between supply and demand in a number of markets and resulted in significant price declines for market pulp, newsprint, coated papers, and uncoated free-sheet papers. Most of the price and earnings deterioration for these grades has already occurred, with the exception of newsprint. A number of efforts have been made to raise product prices in the past few months, particularly for uncoated papers and market pulp, but any meaningful recovery will depend on boosting demand by a substantial amount this year and again next year.

For 1992, paper production is forecast to increase to 40.3 million tons, a 3.7% increase over 1991. Full-year operating rates for paper grades should reach 90.4% this year, up from 1991's trough level of 89.6%. Uncoated free-sheet papers and coated papers will show the largest volume gains, but both grades will fall short of having a tight balance between supply and demand. As a re-

sult, there are conflicting views about price movements this year.

Chad Brown of Merrill Lynch predicts that coated paper prices will average about 1% lower in 1992, but analyst Jeannne-Carroll of Morgan Stanley believes that coated paper prices will begin turning upward in the second quarter. Uncoated paper prices are already recovering from their cyclical lows.

Paperboard production in 1992 is expected to increase by 3.1% to 41.2 million tons. Since paperboard capacity additions in 1992-93 will be at the lowest level since 1985, paperboard mill operating rates are forecast to exceed those posted by the paper grades. In fact, semichemical paperboard operating rates are forecast to be the highest of any major grade in 1992. An upturn in industrial production and continued export growth should boost demand for linerboard and corrugated boxes. Merrill Lynch's Brown predicts that linerboard prices will average about 9% higher in 1992, and corrugating medium prices will average about 15% higher. Bleached board average prices may decline slightly due to an inventory adjustment in early 1992.

TABLE 2: **Industry production (000 tons).**

Paper	1988	1989	1990	1991e	1992e
Newsprint	5,982	6,088	6,610	6,740	6,925
Uncoated groundwood	1,624	1,743	1,806	1,780	1,830
Coated paper	7,359	7,215	7,536	7,260	7,750
Uncoated free-sheet	11,277	11,081	11,503	11,405	11,970
Bristols	1,150	1,163	1,152	1,145	1,160
Thin paper	281	262	218	195	190
Cotton paper	169	161	155	150	150
Packaging and industrial	5,033	4,916	4,576	4,465	4,515
Tissue	5,476	5,636	5,802	5,715	5,805
Total paper	**38,351**	**38,265**	**39,358**	**38,855**	**40,295**
% change	**4.0%**	**−0.2%**	**2.9%**	**−1.3%**	**3.7%**
Paperboard					
Kraft linerboard	17,897	18,056	18,808	18,938	19,532
Other kraft	1,244	1,434	1,549	1,777	1,950
Total	**19,140**	**19,490**	**20,357**	**20,715**	**21,482**
Semichemical	5,664	5,691	5,710	5,640	5,810
Bleached board	4,511	4,521	4,399	4,600	4,700
Recycled	8,789	8,817	8,956	8,985	9,200
Total paperboard	**38,105**	**38,519**	**39,422**	**39,940**	**41,192**
% change	**1.8%**	**1.1%**	**2.3%**	**1.3%**	**3.1%**
Total paper and paperboard	**76,456**	**76,784**	**78,780**	**78,795**	**81,487**
% change	**2.9%**	**0.4%**	**2.6%**	**0.0%**	**3.4%**

Source: American Paper Institute and *Pulp & Paper* estimates.

TABLE 3: **Industry operating rates (%).**

Paper	1988	1989	1990	1991e	1992e
Newsprint	97.8%	96.7%	96.8%	94.0%	94.5%
Uncoated groundwood	95.7	93.0	93.9	92.7	94.9
Coated paper	94.0	92.0	93.8	85.6	87.4
Uncoated free-sheet	94.8	91.6	93.3	88.0	89.0
Bristols	96.2	97.3	95.0	93.0	95.3
Thin paper	85.0	93.2	80.7	76.5	79.1
Cotton paper	83.3	79.7	81.2	79.4	80.2
Packaging and industrial	93.3	90.5	85.8	79.5	80.6
Tissue	96.6	97.2	97.1	93.5	93.1
Total paper	**95.4**	**93.0**	**93.2**	**89.6**	**90.4**
Paperboard					
Kraft linerboard	95.7	94.1	95.9	93.9	96.0
Other kraft	79.5	85.1	90.0	92.5	95.0
Total	**94.4**	**93.4**	**95.4**	**93.4**	**95.3**
Semichemical	97.8	98.4	97.7	97.0	97.1
Bleached board	95.3	95.8	95.2	94.1	94.6
Recycled	92.2	91.7	89.3	85.9	88.1
Total paperboard	**94.5**	**94.0**	**94.3**	**92.3**	**93.5**
Total paper and paperboard	**94.9**	**93.5**	**93.7**	**91.1**	**92.5**

Source: American Paper Institute and *Pulp & Paper* estimates.

MERGERS AND ACQUISITIONS. Few major companies have the financial resources to undertake major acquisitions in the U.S. paper industry as long as credit is in tight supply, and it is unlikely that non-industry firms will make a hostile bid. "The appetite for initiating hostile bids on the part of corporate managers and financial entrepreneurs is down sharply," says Barry Friedberg, head of investment banking at Merrill Lynch.

The major scene of merger and acquisition activity this year will be in Europe because the transformation to a single market in 1992 creates the need for larger companies to create economies of scale and greater pricing power. U.S. companies that have already expanded in Europe include Stone Container Corp., James River Corp., International Paper Co., and Kimberly-Clark Corp.

As always, however, there will be transactions involving the purchase and sale of individual mills, as well as converting and distribution operations. Some companies are selling assets to improve their operating results, while others are attempting to restructure operations to focus on core businesses. The recent decision by Georgia-Pacific Corp. to sell its Maine newsprint properties to Bowater Inc. is typical of this trend. James River, Boise Cascade Corp., Scott Paper Co., and Weyerhaeuser Co., among other paper companies, have recently divested assets to strengthen financial performance. As industry earnings and net free cash flow increase, the climate for larger transactions will be more favorable.

Long-term outlook

Strong export demand to offset slower domestic growth

■ U.S. demand for paper and paperboard is forecast to increase at a 2.4% annual rate during the 1990s, compared with a 2.9% annual clip in the prior decade, according to FORECASTER SERVICES *Ten-Year Outlook 1991-2000*. As always, expectations for the general economy, including critical variables such as advertising expenditures and industrial production, go a long way in determining prospects for the paper industry. But it is also worth keeping an eye open for the impact of several other factors, such as competition from electronic communications, the costs of environmental compliance, and the shift to recycled-content products. In the meantime, in a reversal of what happened during the 1980s, export tonnage growth is expected to outpace that of imports so that U.S. production should rise 2.6% per annum, basically on par with growth during the 1980s.

PAPER. Helped by growing exports, total paper production is pegged to grow at a 2.6% average annual rate during the 1990s vs 2.8% during the 1980s. But there likely will be significant discrepancy between performance among the various grades.

Newsprint, for one, could well underperform. Of particular concern to producers is that newsprint has been losing share as an advertising vehicle and newspaper readership is declining, suggesting that recent drops in consumption might be more than just a cyclical swing. Also, although having only a small impact on projected newsprint consumption in the *Forecaster's 10-Year Outlook*, electronic information services (EIS) might yet take a bite out of newspaper's customer list. Finally, the legislation-backed trend to recycled-content newsprint is adding extra financial burden on this struggling industry as manufacturers scramble to build recycling facilities.

The outlook for printing/writing papers is brighter. Even demand for these grades, however, is not expected to match the growth rates achieved in the 1980s. The projection for slower growth for printing/writing papers is due to several factors, such as maturation of the business communication boom, in addition to the aforementioned threat from advancing electronic media and the slower growth in advertising expenditures.

Domestic tissue markets are expected to be competitive during the 1990s due to relatively mature end markets, modest domestic population growth (0.7% annually), and rapidly increasing capacity. Growth in shipments of commercial/industrial grades are likely to continue outpacing consumer grades, 2.5% annually vs 1.3%. Given the relative maturation of the domestic market, U.S. companies will continue to focus energy on expansion abroad, where per capita consumption levels are considerably lower than in North America.

Packaging and industrial papers is one of the few categories likely to experience higher demand growth during the 1990s than it did in the prior decade. The key here is that after having lost substantial market share to plastics during the 1980s, unbleached kraft production looks to be stabilizing as it benefits from consumers' perception that it is more environmentally friendly than plastics.

PAPERBOARD. *Forecaster* predicts that total paperboard production will register a 2.6% annual growth rate during the 1990s compared with a 2.5% growth rate per annum from 1981 to 1990. Healthy growth in industrial production (forecast at 3.2%/year) plus strong export growth are the key factors underlying this projected performance.

Aided by reasonably priced softwood fiber supplies, the U.S. is the world's leading exporter of paperboard grades, principally kraft linerboard and bleached board. And *Forecaster* expects the U.S. paperboard producers, helped by a weaker dollar, to leverage their operating advantages and make further gains in the export arena during the 1990s.

That said, there are a few variables that might be working to retard tonnage growth in paperboard. In particular, solid waste problems have focused attention on efforts to reduce packaging for a given product. Also, spurred by a revision to the rail carriers Uniform Freight Classification-Rule 41, the containerboard industry might witness an increasing use of lighter-weight boards, thereby decreasing demand in terms of tonnage.

In the meantime, as announced expansions and conversions by Temple-Inland Inc. and Stone Container Corp. foreshadow, regardless of overall growth, recycled paperboard is going to be taking an increasing chunk of the market. For instance, recycled linerboard is forecast to climb from 2.7% to 8.2% of total domestic demand for total linerboard production, while recycled medium is expected to move from 27% to 38% of total corrugating medium.

TABLE 4: **U.S. production (000 tons).**

				% change	
	1980	1990	2000	1981-90	1991-2000
Total paper/board	61,041	78,675	101,530	29%	29%
Total paper	30,117	39,412	50,790	31%	29%
Newsprint	4,673	6,615	7,887	42%	19%
Printing/writing	15,521	22,382	30,962	44%	38%
Tissue	4,439	5,802	6,932	31%	19%
Packaging/other	5,484	4,613	5,009	−16%	9%
Total paperboard	30,924	39,263	50,740	27%	29%
Unbleached kraft	15,295	20,335	25,760	33%	27%
Semichemical medium	4,723	5,829	6,500	23%	12%
Bleached board (SBS)	3,835	4,380	5,370	14%	23%
Recycled paperboard	7,071	8,719	13,110	23%	50%

Source: *Forecaster Services 10-Year Outlook 1991-2000.*

Uncoated free-sheet

Office papers lead demand growth

■ Uncoated free-sheet mills suffered drastic price cutting in 1991 as a result of the economic recession and massive capacity expansions. However, the combination of a partially recovering economy and inventory building due to three announced price increases caused a surge in demand in the last part of the year. Analysts suggest that demand will remain basically flat this year, advancing from 3.5% to 4% over 1991. Growth will rebound to about 6% in 1993.

Leading the pack is paper used in office reprographics, primarily computer page (laser) printers and copy machines. This sector is expected to grow by 8% or better this year. Operating rates for uncoated free-sheet paper mills in 1991 averaged from 89% to 91%, depending on estimate, and will probably hover around 92% this year. Bruce Kirk of S.G. Warburg Securities suggests that 1992 apparent consumption of uncoated free-sheet paper will be about 12.3 million tons, up almost 7% from last year, compared with a capacity increase of 3.0%.

Jaakko Pöyry Consulting Inc. said consumption of uncoated free-sheet papers is expected to rise about 4% to 5% this year, compared to 1991. Cut-size papers will continue to lead demand and forms bond may improve. Other than additional tonnage from machines already online, no new U.S. or Canadian capacity is due online this year. Champion International Corp. has scheduled startup of a 240,000-tpy uncoated free-sheet machine at Courtland, Ala., for the end of 1993. Also, more capacity from Brazil will be aimed at the U.S. market.

FORMSMAKERS STILL WEAK. An economic turnaround this year could return forms manufacturers to positive sales growth, but the combination of an anemic recovery and forms industry overcapacity will dampen the industry's profitability outlook and encourage further consolidation and restructuring among forms producers. This forecast is according to analysts with the trade group International Business Forms Industries Inc. (IBFI).

Forms converters have had to evolve from an orientation toward manufacturing and the steady expansion of production capacity to one of technology and marketing. Forms manufacturers are including such products as preprinted cutsheet, labels, forms management programs, and promotional printing in their product and service mix. The forms management programs can include nonforms products such as electronic forms design software and integration of Electronic Data Interchange (EDI) standards and systems.

Traditional product lines, such as stock and custom continuous forms, unit sets, and sales books, were particularly hard hit by the economic recession, while cutsheets and pressure-sensitive labels continued to record positive growth, IBFI reported. Generally speaking, the brightest outlook is for preprinted cutsheets and pressure-sensitive labels.

MODERATE GROWTH AHEAD. Most grades of uncoated free-sheet papers are pegged at similar growth rates. All forecasts are based on the economy turning up and do not include a possible "double-dip" recession, which could occur in the first half of this year. In that light, demand for offset printing papers is expected to rise 3% to 4%, while cover and text grades will advance about 3%, and carbonless paper will grow from 3% to 5%.

Coated paper

Prices stay loose as demand rises

■ Producers of coated printing and publishing papers can expect continued rebound in demand, if the economy continues to recover, analysts say. However, even the uptick in demand will not help prices recover fully until 1993, and a so-called "double-dip recession" in the first half of the year could send markets reeling back down to their lows of 1990-91.

Assuming a continuing economic recovery, demand for coated papers should move above 5% compared with 1991, according to John Maine, vice-president, Resource Information Systems Inc. (RISI). But Maine expects pricing to remain weak. Demand in 1993 could rise 8% to 9% above 1992, he said.

Jaakko Pöyry Consulting Inc. said that coated groundwood paper consumption should post a 5% to 6% increase over 1991, with catalogs and advertising inserts leading the demand increase and a bit of a comeback in magazines. Coated free-sheet consumption may rise 7% to 8%, with a boost from election year politicking. Some of the direct-marketing materials used by candidates include coated free-sheet paper. Also, there will probably continue to be substitution of coated free-sheet paper for coated groundwood, Jaakko Pöyry said.

Jaakko Pöyry estimates that coated groundwood mills will use about 95% of capacity this year, with coated free-sheet mills posting operating rates in the mid-80s.

Coated groundwood grades are still expected to suffer the consequences of a relatively weak magazine market, which accounts for perhaps 50% of coated groundwood paper demand. Coated free-sheet grades are even more vulnerable, with pressure from both the marketplace and continuing capacity increases. By the end of 1990, two new substantial paper machines had come online, one at Champion International Corp.'s mill in Quinnesec, Mich., and the other at Scott Paper Co.'s S.D. Warren Div. in Maine. Consolidated Papers Inc. expects to ramp up its new coated free-sheet machine in Wisconsin this year, adding to the capacity surge.

Growth in demand for Nos. 1, 2, and 3 grades, along

with C1S paper, are expected to average 5% or less. No. 4, including both groundwood and free-sheet grades, will average 3.7% growth, and No. 5 groundwood papers will run about 3.9%. Pricing levels for all grades should rise at least once by the end of next year, though continued economic problems could cause a postponement of any price increases until 1993.

North American producers continue to face stiff competition from European mills, with capacity for coated papers projected to increase 5.2% to a total of almost 6.7 million short tons this year compared with 1991. That is on top of the 13.2% increase in capacity last year. Coated paper capacity will rise another 2.3% in 1993.

Tissue

Producers seek to rebuild margins

■ Producers in both the consumer and commercial and industrial (C&I) tissue sectors were chilled by the 1990-91 recession after many years of slow but steady growth. The away-from-home market suffered to some extent because of its ties to employment and traveling, and the domestic tissue market became more competitive as demand from retailers slowed and new products churned up the market.

Kimberly-Clark Corp.'s re-emergence into the premium consumer bath tissue business in 1990 with its Kleenex product sparked a round of promotional activity among its competitors that is continuing, forcing down product realizations. The industry has since attempted to shake the premium bathroom tissue sector free from excessive promotional activity, with producers implementing price and/or sheet-count reductions in July and August 1991.

Jeanne Carroll, an analyst with Morgan Stanley & Co., said that when tissue manufacturers have reduced the list price in the past they have also generally reduced promotional programs by a similar amount. But, as a result of the economy's shakiness and consumers' stashes of tissue, that move was delayed in 1991. She expected fourth-quarter promotions would be similar to those in the third quarter but believes the tissue sector will recover in first-half 1992.

The other method to rebuild margins is to boost prices, and at least one tissue firm plans to do so. Procter & Gamble Co. spokeswoman Lynn Hailey said that the company would institute a moderate price increase on its premium consumer bathroom tissue brands, Charmin and White Cloud, by reducing trade promotion allowances beginning in January 1992. These two products hold about 30% of the market, according to George Adler, analyst with Smith Barney, Harris Upham & Co.

The price hike attempt may be premature. K-C's new Kleenex premium bath tissue is already on the market in nearly half of the U.S., and plans are afoot to roll it out nationally. K-C spokeswoman Colleen Berman acknowledged that national marketing of the Kleenex bath tissue would require "another machine or another mill."

Price hikes for C&I tissue were announced at the end of August 1991. Fort Howard Corp. said it would seek a 5% across-the-board increase in commercial tissue, according to Morgan Stanley's Carroll. James River Corp. and Chesapeake Corp. followed suit. Carroll estimates market leader Fort Howard holds 25% of the market, followed by JR with 21% and Scott Paper Co. with 17%.

With the economy improving, Smith Barney's Adler predicts prices and profits will pick up by this spring. And Carroll said that, on the whole, the U.S. tissue market will remain favorable over the next few years due to favorable pricing of raw material and limited new supply.

Containerboard

Ready for the next up-cycle

■ Containerboard should be one of the first segments of the paper industry to improve when the economy begins to strengthen, according to most analysts. With only limited growth expected in linerboard and corrugating medium capacity over the next couple years, any pickup in demand should result in relatively high operating rates in 1992 and a tight market in 1993. "Linerboard should be one of the best-positioned paper products in the coming cycle," says Mark S. Rodgers of Prudential Securities.

The recovery in containerboard is already under way, with a successful $30/ton price increase last fall, which brought the transaction price for linerboard to around $350 in the eastern U.S. This reversed an eroding trend that began in the second half of 1989 and carried prices close to the break-even level for some higher-cost mills. Now the main question seems to be, how fast will the recovery proceed?

One of the more optimistic analysts is Thomas P. Clephane of Morgan Stanley & Co., who expects corrugated box shipments to rise by 4.5% in 1992, following a 0.5% increase last year. He projects that linerboard operating rates will average about 95.1% in 1992 and rise to 96.7% in 1993. He expects the price of linerboard to advance to about $380 by second-quarter 1992 and reach its previous peak of $410 by the fourth quarter.

Somewhat less positive is Bruce Kirk of S.G. Warburg Securities, who projects corrugated box shipments will grow by only 2.6% this year. He expects linerboard operating rates to average 95.7% in 1992 and 96.4% in 1993. Slower economic growth will make a linerboard price increase difficult in the spring of 1992, and he expects only one successful price increase in the third quarter. Corrugated box buyers would also have difficulty accepting more than one increase at this time, he believes.

The main factor behind the optimism is the re-

strained outlook for containerboard capacity growth. Clephane, for example, expects kraft and recycled linerboard capacity to grow only 1.6% in 1992 and 2.3% in 1993 (based on a May 1991 American Paper Institute capacity survey). The only new linerboard machine planned is Temple-Inland Inc.'s new 215,000-tpy recycled linerboard machine, which is now scheduled to start up at the end of 1992 at Maysville, Ky. No new machines have been announced for corrugating medium, a grade that is already in tight supply—after being "beaten to death" in the last industry downturn, according to one supplier.

One uncertainty is how strong U.S. linerboard exports will be this year, following an estimated 17% to 18% surge in 1991, based on API statistics. Corrugated box demand in Europe has been softening due to slower economic growth in Germany and most other major countries. U.S. linerboard exporters were unsuccessful in pushing through a price increase last fall in Europe. But they may still be able to push through a more recently announced $40/metric ton increase in the first quarter of this year, due to the recent drop in the value of the dollar. "Even with the increase, U.S. kraft liner will still be cheaper than Scandinavian board (priced in local currencies)," one agent noted.

Any weakening in linerboard exports to Europe would probably be partly offset by higher shipments to the Far East and Latin America. And if the sputtering U.S. economy ever gets into gear, U.S. linerboard mills might even welcome some cooling in exports so they can keep up with domestic demand.

Boxboard

Slow growth expected in 1992

■ Consumer spending is expected to remain weak during the first half of 1992, and this could reduce demand for folding boxboard and other consumer packaging grades. In recent months, inventories at folding carton plants have increased as industry shipments have slowed, and the Paperboard Packaging Council has forecast only a 0.5% increase in folding carton shipments this year. Any upturn in the U.S. economy in the second half of the year could boost retail sales and improve the outlook for solid bleached sulfate (SBS), unbleached kraft, and recycled boxboard grades.

The economy will affect each of these major grades differently. Bleached board prices are currently at peak levels, reflecting a 5% increase to approximately $870/ton for carton grades that was implemented in mid-1990. Bleached board production also climbed steadily to record levels, following the completion of a large number of machine rebuilds in 1990-91. Capacity jumped 5% to 8% over the last 12 months, and some additional capacity increases are expected in 1992. As a result of this new capacity, and a possible inventory adjustment early in the year, SBS prices may come under increasing pressure.

SBS production, including milk cartons, cup stock, and exports, is forecast to increase by 2.8% to almost 4.7 million tons this year. Domestic shipments are forecast to increase by 1.7% and exports by 8.7%. Folding cartons and exports will continue to pace SBS growth, while food service packaging will remain weak. Operating rates will be lower early in the year, falling to 91% to 92%, but rates should recover to 95% to 96% in the early phase of the expected industry recovery later in the year.

Production of coated unbleached kraft boxboard increased by more than 20% in 1991, paced by additional output from Mead Corp.'s new board machine. Most of this board is used to manufacture carriers for beer and soda, but inroads have also been made in the traditional folding carton markets. The worldwide market for coated board is growing 10% annually, and is expected to continue at this rate until the mid-1990s. Because of this strong growth trend, Mead and Riverwood International Corp. both raised their prices in 1991.

Recycled grades have been supported by strong demand for folding cartons and shipping containers made from recycled paper, but poor demand for the construction grades has depressed operating rates for this sector. Production of folding carton grades climbed 5% in 1991, but gypsum wallboard dropped nearly 25%, resulting in virtually no change in total output for the year. For 1992, total production of recycled grades is forecast to increase by 3.8% to 9.5 million tons. The highest growth rate will come from the containerboard grades, which are discussed elsewhere in this section.

Recycled boxboard producers did not attempt to raise prices in 1991, despite higher prices for SBS and coated kraft grades. The last price increase for recycled folding carton grades occurred in fourth-quarter 1990. Current prices for clay-coated newsback (CCNB) grades are approximately $545/ton, with higher prices for kraft back grades and customers on the West Coast. If the output of recycled folding boxboard continues to reach record levels, as it did last October, producers are expected to attempt a price hike in early 1992.

The 1992 forecast remains conservative for SBS but somewhat better for coated kraft and recycled grades. The 1992 forecast assumes a weak economy in the first half of the year, followed by a strong recovery in the second half of the year.

Wastepaper

Recovery will be short-lived

■ Wastepaper projections look better for 1992, but the anticipated recovery is not expected to last long. As early as 1993, conditions could begin to deteriorate again due to flourishing supplies. Wastepaper consumption is expected to improve this year because of expanding re-

cycled paper and paperboard capacity. This will cause some paperstock prices to rise, providing an incentive for increasing collections. As generation mounts, though, the supply/demand equilibrium will be upset and the market will tumble down again sometime in 1993.

This was the consensus of opinion from forecasters and market executives who cover the industry. Some were more pessimistic than others, but all generally draw a gloomy outlook for at least parts of 1992 and beyond. The shake-up in the wastepaper business, which has seen many smaller brokers and dealers acquired by larger firms, including paper companies and waste haulers, is expected to continue—though at a slower pace than in recent years. Into the foreseeable future, the processing and selling of wastepaper is not an attractive business.

The wastepaper business, in fact, appears to be headed for a long recession. Factors that once controlled the marketplace have changed. Waste haulers are steadily taking over collections of the lower grades. More and more municipalities are starting curbside collections, and offices are starting their own sorting programs. It is anticipated that municipal and office collections will continue to grow, providing a seemingly endless potential for wastepaper generation.

Even the numerous new recycled paper and paperboard expansions that started up in 1991 or will come onstream in the coming years will not really absorb the burgeoning flow of recyclable paper being made available by continually increasing collections. In recent years, municipal curbside collections have inundated the marketplace with old newspapers (ONP). Now, these programs are starting to expand into grades such as old corrugated containers (OCC) and mixed papers. Also, office collection programs are proliferating, adding to supplies of high-grade deinking papers and pulp substitutes.

TECHNOLOGY IMPROVEMENTS WOULD HELP. Government intervention in the marketplace—through recycled-content mandates, procurement provisions, and recycling goals—will continue to push public and private sectors into sorting out their recyclables from the solid waste stream and will force industry to strive for ever-improving technology to manufacture products containing recycled materials. Eventually, this may lead to technology which can absorb much of the wastepaper that is collectable.

The major force in the marketplace in 1992 will probably be the continuing evolution of office collection programs, said Fred Iannazzi, president of Andover International Associates. Offices have traditionally tried to sort out only the highest grades from the office waste stream. However, more and more offices now are collecting all grades, and mills are accepting more and more of the lower grades. Companies such as Fort Howard Corp., Union Camp Corp., and James River Corp. have their own specifications for what they will accept from offices.

SOME PRICES MAY IMPROVE. Despite generally improved market conditions in 1992, though, prices are not expected to rise across the board. Specific grades will be affected by their own special factors. Pulp substitutes prices, for instance, normally follow market pulp prices. If woodpulp prices remain depressed in 1992—as some expect they will—pulp substitute prices will not improve. Deinking grades are also linked to some extent to woodpulp prices, as well as to export demand for such grades as the sorted ledgers.

Bulk grade prices for ONP and OCC are tied to the supply/demand balance, which is expected to improve in 1992. The best bet is that OCC prices will rise because municipal collection systems for this grade are still in the formative stages, according to Iannazzi. A paperstock broker agreed, expecting that OCC demand from linerboard mills would pick up significantly sometime in 1992. ONP prices, though, are expected to remain relatively flat. Iannazzi doesn't expect ONP prices to rise through 1995. David Clapp, economist for Resource Information Systems Inc., agreed, noting that any rise in ONP prices would result in increased generation, which would erode prices once again.

DEINKING CAPACITY EXPANDING RAPIDLY. ONP demand, though, will be one of the healthiest signs in the marketplace. Deinking capacity will expand substantially over the next several years, particularly for newsprint production. In 1991, at least 45 deinking facilities were started up in the U.S. and Canada, adding more than 3 million short tons of recycled fiber capacity.

Recycled newsprint capacity was projected to increase by 150% by the end of 1991. Thirty percent of that capacity was to contain at least 40% recycled fiber by the end of 1992. Ten new newsprint deinking facilities started up in 1991, adding just over 1 million tons of recycled fiber capacity, and eight are expected to start up in 1992, adding nearly 900,000 tons. In tissue production, more than half of the 400,000 tons of tissue capacity coming onstream from 1990 to 1993 will use deinked wastepaper.

Overall, the industry continues to forge ahead toward the American Paper Institute's goal of 40% recovery by 1995. U.S. wastepaper recovery reached nearly 29 million short tons in 1990, according to API. Analysts project that between 30 million and 33 million tons will be recovered this year. This is expected to increase to anywhere from 38.5 million tons to 40.7 million tons by 1995.

CONSUMPTION PROJECTIONS LOOK GOOD. Consumption of U.S. wastepaper will rise to between 23.1 million and 25.4 million tons in 1992, and to about 30 million tons in 1995, according to analysts. This is up significantly from the approximately 22 million tons consumed in 1990. Much of the growth will be in ONP and OCC. ONP consumption is expected to rise to just under 5 million tons in 1992 and to between 5.7 million and 6.5

million tons in 1995. OCC consumption is forecast to increase to approximately 12 million tons in 1992 and then to between 14.6 million and just over 15 million tons in 1995.

The prognosis for wastepaper exports varies widely. Clapp believes exports will grow to more than 8 million tons in 1992 and to 10.3 million tons in 1995. Iannazzi, however, forecasts that exports will move up only slightly to 6.8 million tons in 1992 and to just under 7.8 million tons by 1995. ONP exports are forecast to increase to between 1.3 million and 1.7 million tons in 1992 and to between 1.5 million and 2.4 million tons in 1995. OCC exports will move up to between 3 million and 4 million tons in 1992 and to between 3.8 million and 4.1 million tons in 1995.

LEGISLATION MAY EASE A BIT. Legislators may ease up somewhat on their attempts to control the industry in 1992. Most states already have set recycling goals for 1992-93 and 1995, said Clapp. Now they are in a wait-and-see mode. If their goals are not met, amendments to these initial bills could come in a year or two. "Severity of these measures will depend on the severity of the solid waste crisis," said Clapp.

Iannazzi believes that legislators will have to come around to the realization that some of the laws they have adopted are unrealistic. He cited the recent proposal by the Recycling Advisory Council, which lists recycled-content percentages for various grades of paper and paperboard. On the printing and writing grades, for instance, a recycled content of 50% is unattainable, Iannazzi noted, because a high percentage of the content of printing/writing grades is not fiber at all, but fillers and coatings.

Pulpwood

Wood products gyrate but chips hold even

■ The wood products market has been enlivened over the past year by a dramatic swing in prices as buyers prematurely anticipated shortages but underlying demand remained soft. Against that backdrop, woodchips were held in stasis by the counterbalancing forces of weak supply and demand.

Wood products prices trended up after the Fish & Wildlife Service (FWS) proposed in the spring of 1991 that 11.6 million acres of forestland be set aside in the Pacific Northwest as spotted owl habitat. Resource Information Systems noted that these timber lockups, together with other harvesting restrictions, could halt nearly all federal timber sales in the Coast region this year and beyond. An analyst with Smith Barney, Harris Upham & Co. said this perception "led to a wave of scare buying similar to the binge in mid-1989." Low lumber inventories and bad harvesting weather in the South also made wood products customers anxious to buy.

But with FWS cutting back on the amount of sheltered owl habitat in August to 8.2 million acres and with improving weather in the South and little significant recovery in housing starts, upward pressure on prices eroded. Lumber and plywood prices peaked at the end of second-quarter 1991 and then sank back down.

However, the market is expected to strengthen in coming months as housing starts pick up and timber lockups continue to restrict supply. Prudential Securities analyst Mark Rogers believes that the wood products business is "emerging from a ten-year down cycle and will enjoy its most profitable cycle since the 1970s." At least through early 1992, however, Rogers expects pricing volatility.

While all these forces swirled around timber and lumber, the woodchip market in 1991 was a "nonevent," according to one fiber supply manager in the Pacific Northwest. "The downtime in the solid wood industry (due to the poor economy), which has diminished the supply of chips, has been offset by near equal downtime in the pulp and paper sector," he said. "That left inventories and prices at a constant level." The market for hardwood chips has softened with Japanese purchasing off, he added, and that could lead to a downward trend in pricing. In the fourth quarter, however, prices for chips exported from the West Coast to Japan remained at third-quarter 1991 levels, with Douglas fir going for $122.00/bdu f.o.b. vessel, red alder for $120.00, and spruce/pine/fir for $123.60, according to *Wood Fibre Northwest*.

Although sawmill curtailments have impinged on the supply of chips, "whole-log chipping has been stepped up to fill the void," said another fiber manager in the Pacific Northwest. And fiber buyers may soon have another option if the Forest Service releases timber in northeastern Oregon that has been killed off by the spruce budworm, he added. As in the U.S., current chip inventories in British Columbia are "relatively comfortable," noted one buyer. Chip prices had dropped some in the fourth quarter, but he expected relatively static pricing on into first-quarter 1992.

In the Southeast, one senior forester said exports had dropped off some, freeing up chips for domestic users. Also helping to ease market tightness was the end of an extended rainy season, followed by about a month and a half of dry weather, when chip buyers restocked after running quite low. He said fourth-quarter chip demand was similar to the third quarter, though he expects it to pick up in the new year as chip customers build inventories in preparation for more wet weather. He predicted prices would hold steady in the fourth quarter compared with the third quarter but would then incline in first-quarter 1992. He added that pine roundwood prices dropped from the third quarter to the fourth quarter, while hardwood rose. Pine stocks were high but hardwood was scarce because it is found in wetter regions that were harder to access in the rainy season. ■

Another Year of Bottom-Line Losses and Capacity Shutdowns Could Be In Store

The good news from Canada is that its general economy emerged from recession in the second quarter of 1991, and, despite subsequent sluggishness, the Canadian government expects economic conditions to be "much better in the near future." Even so, the bad news for export-driven companies in the Canadian forest products industry is that current and prospective earnings are so bleak that many observers are no longer comparing the industry's downturn with the dip in 1981-82, but rather with the depression years of the early 1930s.

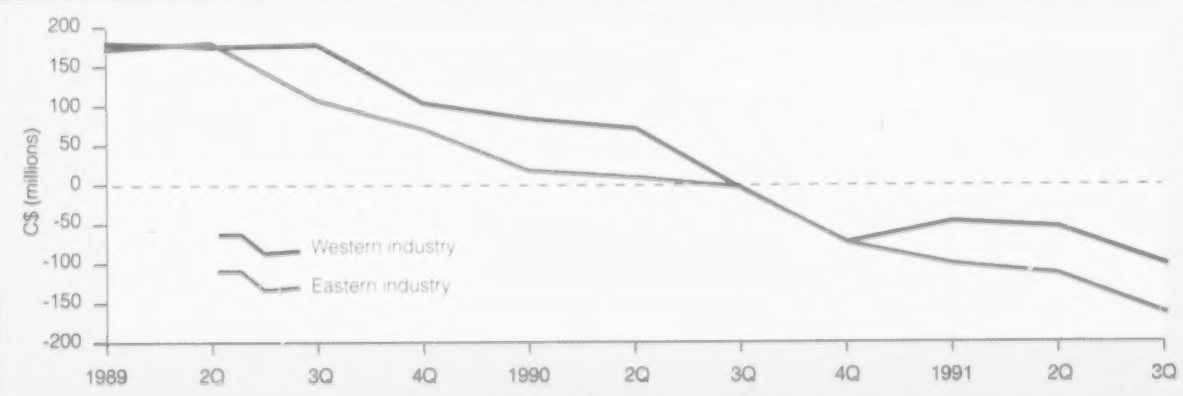
1991 WAS A DISASTER. A *Pulp & Paper Week* survey of 18 Canadian forest products companies showed a net loss, excluding nonrecurring items, of C$705 million for the nine months ended Sept. 30, 1991. Everything was going wrong. Newsprint prices, which many had hoped would improve or at least stabilize in 1991, headed lower throughout the year as advertising increasingly turned to more focused and specialized media, causing newsprint consumption to drop faster than anticipated. And northern bleached softwood pulp prices, after peaking at US$830/ton in 1989-90, sunk $500/ton and below by late 1991, as the worldwide buildup in pulp capacity coincided with cyclical weakness in demand. In the meantime, wood products manufacturers, despite a flicker of revival in the spring, struggled through yet another year of low product prices, as the construction industry failed to bounce back despite falling interest rates. As 1991 progressed, Canada's currency seemed to be the only commodity that was gaining value south of the border. Starting the year at US85.5¢, the Canadian greenback was trading at about 88¢ in early December 1991. This hurts Canadian producers because most of their products are priced in U.S. dollars, while costs are incurred in local currency.

A TURNAROUND IS NOT EXPECTED IN 1992. The supply-demand equation suggests that the forest products industry should brace for another chilling year at the bottom line. On the consumption side, prospects for the North American economy are mixed, with few signs of a strong recovery. And of at least equal concern are apparent structural changes affecting demand for Canada's two key pulp and paper products, newsprint and market pulp. Newsprint manufacturers are being devastated as depressed advertising dollars increasingly shift to other more focused and specialized media. Market pulp producers, meanwhile, stand to lose out as manufacturers place growing emphasis on the use of recycled fibers.

On the supply side, the world is awash in pulp and paper, especially newsprint and market pulp, following excessive capacity expansions in recent years. A good deal of attention is now being focused on where the capacity rationalizations needed to bring supply and demand back into equilibrium will take place.

Due to antiquated machinery and high labor costs, it

FIGURE 1: **Canadian companies continued to operate in the red in 1991.**



Western industry includes Canfor, Crestbrook, Doman, Fletcher Challenge Canada, MacMillian Bloedel, Scott Paper Ltd., Weldwood, and West Fraser. Eastern industry includes Abitibi-Price, Canadian Pacific Forest Products, Cascades, Domtar, Donohue, Repap, Rolland, and Tembec.

Source: Canadian Paper Analyst.

is expected that the Canadians will bear a disproportionate share of the shutdowns. Already, several mills, including chemi-thermomechanical pulp facilities at Port Cartier and Matane in Quebec as well as an Abitibi-Price Inc. newsprint mill at Thunder Bay, Ont., have been closed for indefinite periods. And other manufacturers, such as E.B. Eddy Forest Products Ltd., have mothballed machines while keeping mills running. Looking ahead, more mill and machine closures are sure to follow as companies are forced to curtail the cash drain. To balance newsprint markets, for instance, Jaak Puusepp of RBC Dominion Securities Pemberton has suggested that, besides Thunder Bay, another seven to eight machines with an aggregate capacity of 330,000 metric tons will have to be shut down in eastern Canada. Capacity reductions, in turn, should eventually lead to improved pricing. But, in a catch-22 of sorts, the Canadian industry will be left with a smaller share of the worldwide market, compromising growth potential, when production and pricing recover.

FUNDING CASH SHORTFALLS. For much of 1991, despite plummeting corporate profits, the share prices of Canadian forest products concerns fared surprisingly well. Whether investors were demonstrating an ability to "look beyond" or an inability to grasp what was going on in front of their eyes is a debatable issue. Regardless, cash-starved companies took advantage of the situation, raising sorely needed capital in a series of equity and rights offerings. (Analysts have also pointed out that a number of industry insiders cashed in during recent strength in the stock market.) Among the tappers of the outside investor, were Noranda Forest Inc., MacMillan Bloedel Ltd., Repap Enterprises Corp. Inc., Domtar Inc., Cascades Inc., West Fraser Timber Co. Ltd., Canfor Corp., and Tembec Inc. Meanwhile, divestments provided cushions for the likes of Abitibi-Price, and Canadian Pacific Forest Products Ltd. And in other cases, such as Temboard & Co. Ltd. Partnership, government agencies and banks have cut deals to help prevent firms from drowning in interest payments.

Given the dismal outlook for corporate earnings in 1992, cash shortfalls from operations will again likely have to be met through external financing, asset sales, or the like. Among possible asset sellers are Domtar, which has suggested it would like to reduce the number of businesses in which it operates; CP Forest, which has indicated that its packaging businesses are for sale; Fletcher Challenge Canada Ltd., which has been toying with the idea of selling a 50% stake in its Crofton pulp mill or divesting other assets; and Noranda Forest, which, following a $51-million loss in the September period, stressed that it "would sell assets as necessary to ensure that the company was well positioned to benefit when the market recovers." Unfortunately, given the industry's cloudy outlook and an overabundance of assets on the auction block, although there may be plenty of willing sellers, it is going to be difficult to find buyers willing to pay a "fair" price.

Making difficult conditions even worse, many Canadian paper companies are having to funnel what scarce capital they have into zero-return projects necessary to keep pace with environmentally driven changes occurring in the industry. Newsprint manufacturers such as CP Forest, Kruger Inc., and Daishowa Forest Products Ltd., for instance, are busy building additional recycling capacity to meet recycled-content demand (backed by legislation in some U.S. states). And fast-approaching environmental hurdles have yet to be cleared at many Canadian pulp mills.

LABOR TROUBLES LOOM AS A POSSIBILITY. Strikes were narrowly averted in British Columbia in September 1991, when unions and corporate managements agreed to a ten-month contract extension that included no wage increases or changes to work rules. New labor negotiations could resume as early as March 1992, and, with management pointing at bottom-line deficits and workers pointing to decreasing salaries in inflation-adjusted dollars, the stage is set for confrontation. The bargaining edge this time around might well lie with management since some strike-induced lost production would actually help firm sloppy markets and lead to de facto payroll cuts, at least temporarily. Also, almost everyone accepts that fundamental changes necessary to increase Canada's competitiveness in the global forest products marketplace must include a reduction in labor costs. But the going is expected to be bitter and tough, particularly as the political tide in British Columbia appears to be shifting to an increasingly prolabor stance.

Newsprint

Markets severely out of balance

■ Newsprint manufacturers and customers alike say they do not expect a recovery in the coming year that will undo the combination of falling consumption and high inventories, which has ravaged North American markets for two years running. Fundamental changes are expected to take place within the newsprint and newspaper industries themselves that may alter the way business is done for the next several years. Manufacturers are analyzing the profitability of their operations as they consider the costs of producing recycled products while buyers grapple with recycled use legislation and reshape their newspapers to hang on to readers and advertisers. Problems facing the newsprint industry go beyond the hardship caused by the current economic recession, but observers are quick to point out that the cyclical downturn could run its course by early 1993, when retail advertising picks up again. Still, several mills and thousands of jobs, especially in Canada, are not expected to survive the industry shakeout.

Lower operating rates with almost 1.2 million metric tons of market-related downtime by producers managed to work off most of the roughly 2 million tons of excess capacity in 1991, but inventories at Canadian mills ballooned to 606,000 tons in October, an increase of 40% compared with the same period in 1990, according to the Canadian Pulp & Paper Assn. (CPPA). September statistics showed that publisher stockpiles were beginning to come down and consumption was not falling as rapidly as before, but mill stocks virtually negated any significant improvement in regard to inventories. Negative consumption figures continued to be disheartening, especially because they were being compared with the period in 1990 that signaled the onset of the current economic recession.

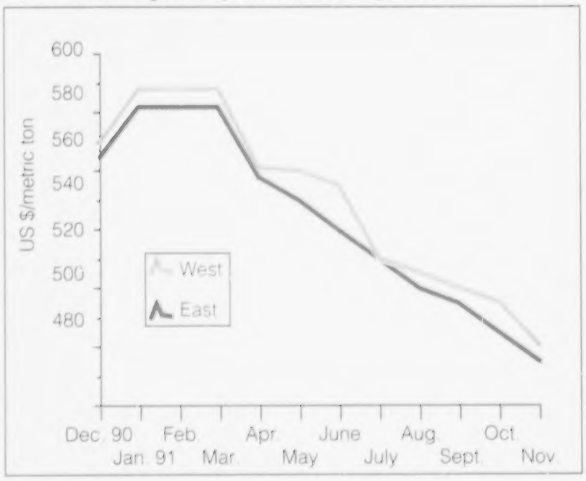
CPPA statistics showed that U.S. consumption dropped 5.8% to 958,000 metric tons in September 1991 and was down 8.0% on a year-to-date comparison to 8.3 million tons. Both aspects indicated some stability in supply and demand since the end of July, but of some concern was a 10% decline in newsprint consumption by U.S. daily newspapers in September, reported by the American Newspaper Publishers Assn. The coming year presents the same problem of too much production and not enough consumption, with excess capacity at about 1.5 million tons, observers conclude.

PRICES ON A LONG SLOPE. With the industry in a full-blown buyers' market, prices dropped about 20% during the course of 1991 as discounts deepened for large and small customers alike. Despite many producers operating at break-even levels, though, companies still did not make the bold moves that appear necessary in order to turn the market around. Abitibi-Price Inc. shut down its Thunder Bay Div. mill in Thunder Bay, Ont., for at least two years, but as of early December no other Canadian producer had taken such a step. Downtime became the rule, although many producers were conspicuously absent from the list of closures. While most observers indicated that the bottom of the price drop should occur by the beginning of 1992, some buyers indicated that, given the lack of dramatic action by the mills, there was no evidence that improvement in the balance of supply and demand was imminent.

Newsprint exports were the saving grace for North American newsprint producers through most of 1991, but Canadians failed to win an emergency increase in the tariff-free quotas to European Community (EC) markets. With such high inventory in North America, Canadian producers were expected to continue to sell in EC countries and absorb the tariff. U.S. newsprint exports, largely to Central and South America, gained 35.6% through September 1991, while new domestic capacity supplanted Canadian imports. Overseas imports to the U.S. slowed to a trickle in 1991, indicating a bloated market unable to absorb any more newsprint.

A gradual decrease of the days-on-hand supply of newsprint at U.S. customers did hold out promise that

FIGURE 2: **Average newsprint transaction prices, 1991.**



producers were going to see a substantial pickup during the Christmas season. An executive with one major newsprint producer noted, however, that November orders showed no sign of a real improvement in demand. Others also observed a seasonal pickup but nothing to be overly cheerful about. For 1992, many producers and buyers indicated that consumption will be flat at best, but declines would not be as bad as those experienced in 1991.

MORE CAPACITY, ESPECIALLY RECYCLED. Total North American newsprint capacity is expected to rise 4.0% from 16.9 million tons in the 1991-92 period and by 0.9% to 17.7 million tons in 1993, according to statistics by the American Paper Institute (API) and CPPA. After a decline of about 7.7% in 1991, domestic consumption is forecast to rise by 2.5% in both 1992 and 1993, according to one financial analyst, hardly absorbing the new capacity. Balance will be achieved by Canadian operating rates in the low-80 percentile, while U.S. mills will achieve 94% in 1992 and 97% in 1993. Total operating rates will hover below 90% for the next two years.

According to a new report by Davis Recycling Consultants (DRC), 26 North American newsprint mills will be producing 7.8 million tons of recycled newsprint (40% of total capacity) by 1993, up from 15% in 1990. With 16 new deinking plants coming online in the next couple of years, recovery rates as well as prices for old newspapers (ONP) and old magazines (OMG) promise to rise, with collection of ONP needing to increase 45% to keep pace with increasing demand from the new mills.

The growth in demand will undoubtedly stretch supply lines and firm wastepaper prices, perhaps increasing prices to $60+/ton, the report states, as traditional sources of ONP and pressroom waste outpace curbside collection volumes. Total ONP recovery rates should increase from 37% in 1990 to 52%, or perhaps as high as 59%, in 1993.

Uncoated groundwood

Strong demand for supercalendered

■ Growth in groundwood papers will be lead by supercalendered (SC) grades, principally the premium SC-A grade, and by soft calendered paper. Annual U.S. consumption of SC paper is currently about 1.5 million tons, of which 90% is clay-filled. About 65% of the consumption is produced in North America; the rest is imported from Europe and Scandinavia. In fact, offshore capacity will be increasing by 1 million tons by 1993, bringing worldwide capacity to over 5 million short tons. Growth is projected at a minimum of 3% annually, with a high of 6% annually, according to the Supercalendered Council. Jaakko Pöyry Consulting Inc. projects 1992 SC consumption growth at 5% to 6% and 2% in 1993.

Despite this growth in demand, pricing for SC-A will still follow coated groundwood, which at the end of 1991 was sadly depressed due to weak market conditions. In fact, several North American SC-A producers sold out of paper at least one month in advance but had to keep the differential in pricing with coated groundwood.

Soft calendering, designed to improve smoothness and printability, has become "hot." These smooth papers will grow 8% to 10% annually during the next five to ten years, far more than any other groundwood grade and even higher than the 5% to 6% expected for lightweight coated papers.

Similarly, uncoated groundwood papers are starting to catch up with newsprint and free-sheet papers as far as using recycled fibers, which until now has been relatively rare. In fact, there will be significant opportunity for papermakers to sell quality grades containing post-consumer waste fiber, though the use of recycled paper is still a developing market in this sector.

GOOD SIGNS AHEAD. Consumption of uncoated groundwood papers is expected to rise about 3.5 to 3.7%/year, compared with 4.2%/year for coated groundwood and 0.7 to 1%/year for newsprint, according to H.A. Simons Ltd. Jaakko Pöyry forecasts a 4% increase in consumption this year, bringing it to around 1990 levels. Total uncoated groundwood consumption could rise 4.5% in 1993, the consulting firm said.

A study by the Graphics Arts Marketing Information Service, completed in late 1991, indicated that paper demand by retailers, excluding coupon merchandisers and consumer goods manufacturers, will decrease slowly over the next decade. There also will be an increasing polarization of grades based on positioning of retailers. For example, upscale retailers will continue to use a higher percentage of SC and coated grades. Discounters and "deep" discounters will continue to use newsprint and lower-value groundwood grades.

Total directory paper use is growing about 2.5%/year. Jaakko Pöyry expects directory paper consumption to advance 3% to 4% this year, compared with no growth in 1991. Groundwood forms is predicted either to remain flat or to decline as various electronic technologies, such as intelligent copiers/printers and laser printers, eat into the overall forms market.

European producers will be trying to sell paper in the U.S. because of increasing overcapacity of publication papers, according to the 1991 capacity survey by the European Paper Institute (EPI).

SC magazine paper will surpass coated grades as the growth leader of the three major sectors, with capacity expected to rise 28.3% from 1991 through 1995, an increase of 887,000 metric tons over the period. SC capacity will reach 4.021 million tons by 1995, EPI reported. However, deliveries are predicted to advance less than 3%/yr, representing just 80% of capacity (3.129 million tons) in 1995, the EPI survey said.

Other grades of uncoated mechanical papers, which represent a small portion of the total publication papers market, will advance 47.2% to hit 976,000 tons in 1995, EPI reported. This is a five-year increase of 313,000 tons. Deliveries will grow at about 1.5%/yr for the period.

Market pulp

Pulp price and demand rebound

■ The past year was difficult for market pulp producers, who had to contend with high raw material costs and poor returns on the finished pulp. They endured months of relentless price declines, with the bellwether northern bleached softwood kraft (NBSK) grade sinking from $830/ton in the U.S. in second-quarter 1990 to $500/ton and below by November 1991. However, producers appeared to rally in fourth-quarter 1991. Price increases on NBSK, southern pine, and southern hardwood pulp that were scheduled to go into effect in various world markets between November and January, were announced, ranging from $20 to $60/ton. Northern softwood was still in oversupply, but southern softwood and hardwood were in relatively tight supply. With inventories down and the dollar weak, producers felt this might be their only chance to push up pulp prices. Waiting for the market to firm further might not have paid off, as capacity from new mills in Alabama, Chile, and Brazil was expected onstream by mid-1992, which could have hurt efforts to raise prices at that time.

Also helping back up the price increase was the rebound in world market pulp demand in 1991. Rod Young, president of Resource Information Systems, attributed the recovery to the end of inventory liquidation in Europe and Japan, resubstitution of low-cost pulp in Far Eastern furnish, and growth in world paper and board consumption. Young estimated that market pulp demand rose 4.5% in 1991 to 31.6 million metric tons after a total decline of 4.4% in 1989-90. Western Europe dominated

consumption, with demand estimated at 14.7 million tons, followed by 7.3 million tons in the Far East, 5.8 million tons in North America, and 3.9 million tons in other regions. World market pulp consumption will jump 6.5% annually in 1992-93, with growth concentrated in Europe and the Far East.

Unfortunately, expansion in supply has, to some extent, undermined the market firming brought about by growth in demand. From 1990 to 1993, expansions will add six million tons to world capacity. Young estimated the ratio of shipments to capacity averaged only 87% in 1991 (the same as in 1990) and will probably reach 93% by 1993. That compares to an average of 97% from mid-1986 through mid-1989.

The excess capacity and weak markets of the last year or two constricted margins to the point where producers in high cost regions such as Finland were operating at varying cost levels. As a result, some high-cost market pulp mills around the globe will likely have to get out of the business for good, leaving the field to low-cost, world-scale mills in low-cost timber regions, according to Georgia-Pacific Corp.'s president and chief operating officer, A.D. "Pete" Correll. He noted that fiber sources such as Brazilian eucalyptus and *radiata* pine from Chile are expanding rapidly and that the cost-effective southern U.S. industry continues to grow.

U.S. softwood market pulp has experienced an average growth rate of 6.1%/year over the last two decades, said David Steuart, president of St. Anne Pulp Sales Co. Ltd. U.S. shipments reached 3.9 million metric tons in 1990, and Steuart predicts U.S. southern pine capacity will reach 4.1 million tons by 1993.

The impact of *radiata* pine kraft pulp has so far been limited because of the small quantities being produced, said Andre Van Bavel, sales director, Celulosa Arauco y Constitucion SA. But its importance is growing, as two new *radiata* pine market pulp mills enter into full production in Chile. The two mills—Arauco II and Celulosa del Pacifico—are adding 700,000 tpy to world capacity.

An expected avalanche of new eucalyptus pulp production is receding. Worldwide, of the 5.1 million tons of bleached eucalyptus kraft pulp originally scheduled to go online from 1991 to 2000, only about 1.8 million tons of new eucalyptus pulp capacity will get to the market, said Boris Tabacof, president of Bahia Sul and of ABECEL (Brazilian Pulp Exporters Assn.). Nevertheless, eucalyptus is gaining over other hardwoods and also over bleached softwoods. Jaakko Pöyry data shows eucalyptus' share of the world bleached pulp market growing from 9% in 1988 to 13% in the year 2000, and Hawkins Wright predicts a shift from 11% in 1990 to 14% in 1994.

In addition to changes in the timber species being used, pulp production processes are also changing. One significant trend is in the bleaching arena. Bleaching pulp with chlorine generates the suspected carcinogen dioxin as well as other chlorinated organic byproducts. Until recently, the industry treated this simply as an environmental problem, but now, the issue is becoming a marketing problem as well, with at least one company reporting it has actually lost pulp sales in Europe as customers favor nonchlorine-bleached pulps.

Some producers have switched to bleaching with chlorine dioxide, which yields fewer harmful byproducts than chlorine, but some environmentalists want the industry to go further. Greenpeace, for example, is calling for an immediate end to the use of all chlorine-based compounds in the bleaching process, said Mark Floegel, a U.S. pulp/paper campaigner with the group.

Incorporating these pulps in finished paper products will require some adjustments among papermakers and their customers. The bulk of the world's paper production is for the printing and writing paper sector, which has traditionally used conventionally bleached kraft (sulfate) pulp. While the concept of using a more environmentally friendly pulp is appealing, there are a number of drawbacks to incorporating such a product in printing/writing grades.

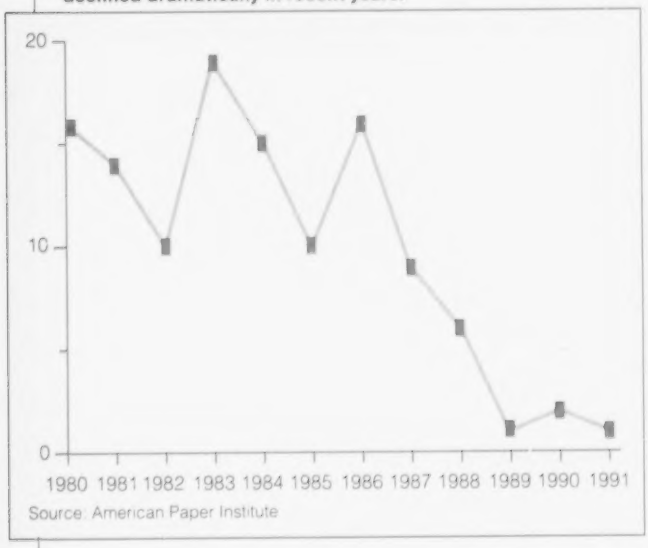
According to Canadian Pulp & Paper Assn. spokesman Pierre Lachance, producers "can't at the moment obtain the qualities desired in terms of strength, purity, and brightness without using some chlorine." Nevertheless, some papermakers and their customers have chosen to content themselves with the properties of chlorine-free kraft pulp, as well as alternatives, including bleached sulfite pulp and bleached chemi-thermomechanical pulp. Kraft pulp treated without elemental chlorine but with chlorine dioxide (and sometimes oxygen delignification) is selling for a premium of about DM30 or $20/metric ton. These price differentials began showing up in Europe in July 1991. Totally chlorine-free pulp is apparently selling for DM110 or $65/metric ton above fully bleached northern softwood kraft pulp and has a brightness in the high 70s to low 80s. Munksjö AB, Södra Skogsägarna AB, Empresa Nacional de Celulosas AS, Metsä-Botnia AB, and Howe Sound Pulp & Paper Ltd. are believed to be the only producers of kraft pulps free of any chlorine compounds.

Labor

B.C. talks in spotlight

■ As market pulp and newsprint producers struggle with overcapacity problems, attention will again be riveted on British Columbia labor negotiations as talks resume, possibly as early as March, after a ten-month extension of the expired contract. The negotiations involve 17,000 members of the Canadian Paperworkers Union (CPU) and the Pulp, Paper & Woodworkers of Canada (PPWC) and 19 pulp and paper mills, representing half of Canada's total market pulp capacity and about 19% of total Canadian newsprint capacity. An industry-wide strike was narrowly avoided in September when the contract was extended to April 1992 with no wage in-

FIGURE 3: **Strikes in the U.S. pulp and paper industry have declined dramatically in recent years.**



Source: American Paper Institute

crease or changes to work rules.

The contract postponement, which was ratified by a 59% acceptance vote, impacted newsprint markets immediately as customers began to work down inventories built up in anticipation of a major labor disruption. Workers gave management the year without cost increases that it demanded, but observers criticized the industry's failure to direct strategic change in British Columbia's labor structure when it appeared to wield the upper hand. With woodchip, pulp, and newsprint stockpiles at record levels, producers as well as customers expected a disruption, even a drawn-out strike, to provide the much-needed downtime. The British Columbia wage freeze in 1991 translated into the first time since the early 1970s that the base wage rate for eastern Canadian workers (CS17.11/hour) surpassed the rate for western workers (CS17.07/hour).

The unions had originally demanded a 12% wage hike in a one-year contract but strengthened their position by meeting the industry's wage freeze demand while avoiding concessions in other areas, such as job descriptions and holidays. With both sides deadlocked over the industry's demand to operate on all statutory holidays and bring down costs across the board, the industry appeared resolved to ride out a strike in order to direct fundamental changes that would go beyond just dealing with the immediate economic recession. Sensing that the irreconcilable positions would lead to a certain strike, labor opted to accept a wage freeze in hopes that the scenario would improve by spring. Although both sides may find themselves with an economic atmosphere equal to or even worse than last year, the unions are bolstered by the recent political success of the prolabor New Democratic Party in British Columbia elections. Still, almost everyone recognizes that fundamental changes are needed to make the province's forest industry more competitive on world markets.

While negotiations dragged on through the summer, two union locals failed to settle local issues and did not formally join the industry-wide negotiations. On Aug. 7, Celgar Pulp Co. locked out 300 members of PPWC Local 1 at the company's mill in Castlegar, B.C., for 18 days in a dispute related to a damage claim against the union. The lockout disrupted an expansion project to double the mill's capacity and removed about 9,900 metric tons of pulp from the market. After the lockout ended, Local 1 joined the protocol negotiations, but PPWC Local 4 and Skeena Cellulose Inc. in Prince Rupert, B.C., remained embroiled over issues related to a job action in 1989 and to contracting out work.

In a move to put themselves in a stronger position for strikes that appear inevitable, CPU members in September voted to more than double their strike pay. Delegates

TABLE 5: **British Columbia paper industry labor negotiations 1991-92.**

	Capacities (metric tpd)				
Company/mill	**Newsprint**	**Paper**	**Paperboard**	**Market pulp**	**Local union**
Canfor Corp., Prince George		295		1,185	CPU/PPWC
Howe Sound Pulp & Paper Ltd., Port Mellon	565			1,000	CPU
Canadian Pacific Forest Products Ltd., Gold River	635			710	PPWC
Cariboo Pulp & Paper Co., Quesnel				950	CPU
Celgar Pulp Co., Castlegar				600	PPWC
Crestbrook Forest Industries Ltd., Cranbrook				580	PPWC
Eurocan Pulp & Paper Co., Kitimat		320	1,000		CPU
Finlay Forest Industries Inc., Mackenzie	600				CPU
Fletcher Challenge Canda Ltd., Campbell River	1,390	87		610	CPU
Crofton	1,400			800	CPU/PPWC
Mackenzie				595	CPU
MacMillan Bloedel Ltd., Nanaimo				1,120	PPWC
Port Alberni	1,000			215	CPU
Powell River	1,900			150	CPU
Northwood Pulp & Timber Ltd., Prince George				1,500	CPU
Skeena Cellulose inc., Prince Rupert				1,350	PPWC
Western Pulp Limited Partnership Inc., Port Alice				470	CPU
Squamish				700	PPWC
Weyerhaeuser Canada Ltd., Kamloops				1,250	PPWC

CPU = Canadian Paperworkers Union, PPWC = Pulp, Paper & Woodworkers of Canada.

at the union's annual conference in Vancouver, B.C., voted to boost their strike pay from $80 to $200/week and to increase their union dues to build CPU's defense fund. The fund totaled close to $8 million in late 1991, while it would cost CPU about $1.4 million per week to pay the new level of benefits if a British Columbia strike occurred. The eastern industry will again negotiate for a new contract in 1993 (the old agreement expires Apr. 30) for about 30,000 members of CPU and the Confederation of National Trade Unions. Strikes in eastern Canada in 1990 removed over 700,000 metric tons of newsprint capacity from the market.

U.S. STRIKES DECLINE. The U.S. industry again remained a quiet and stable contrast to Canada in regard to labor, with one strike at a primary paper facility and two at converting plants through the first 11 months of 1991. About 100 members of United Paperworkers International Union (UPIU) Local 3 at Merrimac Paper Co. Inc. in Lawrence, Mass., received a 5% wage hike after a three-week strike ended July 21. The action occurred during Merrimac's annual maintenance shutdown, and the company took over 700 applications for replacement workers shortly before the strike ended.

Over the past few years, U.S. companies have generally been able to eliminate Sunday premium pay and redesign work practices and job descriptions. More recent developments in labor negotiations include the declining use of lump-sum payments in substitution of a first-year wage increase and a dramatic increase in four- and five-year contracts. Through Nov. 1, 1991, about half of the 41 agreements reached were for more than three years, the American Paper Institute reported. But the number of agreements reached was only about half of what it was during the same period in 1990, indicating some drawn-out negotiations. Wage hikes also dipped during 1991, averaging 2.2% through November, compared with 2.5% for all of 1990, API said. Hourly compensation of U.S. paper and allied product production workers increased at an average annual rate of almost 5.5%/year between 1979 and 1989, rising from $9.64 to $16.45. Rates of increase averaged 7.6%/year from 1979 to 1985 and 2.4%/year from 1985 to 1989, according to the U.S. Bureau of Labor Statistics. In 1992, 62 contracts will expire in the U.S. pulp, paper, and paperboard industry, involving 26,000 workers.

HEALTH CARE A VITAL ISSUE. Among the most pressing contract issues in current labor negotiations is health insurance. Current estimates provided by AFL-CIO show that as of mid-1991, 11.8% of the entire U.S. gross national product went toward health care, and a study by AFL-CIO showed that 55% of all U.S. strikes in 1990 were over health care issues. Currently, it costs the average American company $3,000 per employee for health benefits, and by the year 2005, costs will reach $22,000 per worker. In order to tackle this and other issues, UPIU found an inventive way of establishing cooperation with employers through high-level, joint-labor/management committees with James River Corp., Scott Paper Co., and Champion International Corp. One of the fruits of the union's effort was the formation in May 1991 of a "Health Care Reform Partnership" with James River, a paper industry first, to push for fundamental health care reforms. The partnership promised to break new ground in the search to contain skyrocketing health insurance costs, especially as this increasingly becomes a factor in international cost competitiveness.

Industry analysts said that keeping a lid on escalating health insurance costs will be on the main agenda of most paper companies in labor bargaining rounds through the coming years. Health care costs are currently estimated to consume almost 45% of business operating profits, with the health care rate of inflation almost double the consumer price index in 1990.

Environment

Billion-dollar battle against pollution continues

■ Pulp and paper producers have made considerable progress on the environmental front but will face waves of new and updated regulations in the future. Environmental protection already imposes a significant financial burden on the pulp and paper industry, with spending topping $1 billion annually, according to the National Council of the Paper Industry for Air & Stream Improvement (NCASI). Much of this investment is aimed at water quality protection, with an emphasis on bleach plant modifications to diminish chlorinated organics in effluent.

DIOXINS. Among the most infamous chlorinated organics are the dioxins, a family of 75 compounds demonstrating varying degrees of toxicity. Control of dioxins, particularly 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD), has been a major issue for the pulp and paper industry since they were detected in pulp, effluent, and sludge at U.S. bleached kraft pulp mills. Dioxin 2,3,7,8-TCDD is known to be a virulent carcinogen in lab animals—and this has been the basis for some aggressive antidioxin campaigns—but whether humans are equally susceptible has been the focus of contentious debate.

Because of the uncertainty, the Environmental Protection Agency (EPA) is reexamining the risks of dioxin, and this could lead to revisions in regulations. For the time being, EPA has suggested a limit on dioxin in streams of 0.013 parts per quadrillion (ppq). However, individual states are still free to set their own dioxin standards, subject to EPA approval.

EPA and various states are in the midst of issuing wastewater discharge permits—known as National Pollutant Discharge Elimination System (NPDES) permits—to

limit dioxin discharges from pulp and paper mills that utilize chlorine bleaching. Sixty-six of these permits have been issued to mills found to violate water quality standards for dioxin. Within three years of establishing the permits, the mills must meet water-quality-based effluent requirements developed by the states. New permits at other facilities will be issued as their existing permits expire.

EPA is also developing national industrial effluent limit guidelines and standards, based on best-available, economically achievable technologies, to reduce dioxin contamination and total chlorinated organics from the manufacture of bleached paper products. Those standards will be proposed in 1993 and finalized in 1995 and will entail process changes to prevent the formation of dioxin. By 1995, mills will have to comply with whichever of the two types of standards (i.e., water quality or technology based) is more stringent. Reauthorization of the Clean Water Act came under consideration by Congress in 1991, but the legislature will probably not vote on revisions to the Act before October 1992. The Clean Water Act regulates the discharge of pollutants into U.S. water bodies, primarily through permits that apply to industrial discharges and to publicly owned treatment works.

Several states and territories are being warned by EPA to adopt water quality standards for lakes and rivers or else the federal government will impose its own set of regulations. EPA is scheduled to publish standards on the 105 toxic pollutants involved in mid-February. All states had previously been ordered by Congress to regulate these chemicals by February 1990, but not all had complied. The regulations will be used to control effluent emissions via state discharge permits.

AIR. Regulators have also been active in dealing with air pollution. Late in 1990, Congress passed a clean-air bill updating the Clean Air Act. The wide-ranging legislation includes ozone protection measures and smog controls. Acid rain provisions will both cut sulfur dioxide pollution and set limits on nitrogen oxide emissions.

The new law will also require plants to reduce emissions of 189 toxic and cancer-causing substances (including chloroform) by 90% over the next decade. EPA will develop standards over the next several years for controlling these emissions. NCASI indicated that EPA plans to propose standards for the pulp and paper industry in mid-1993. EPA was also scheduled to establish a framework of minimum requirements by the end of 1991 that states can use to set up air pollution provisions for their permitting programs. By the mid-1990s, most major facilities emitting these toxics will begin applying for these permits.

Other pollution prevention measures are afoot. EPA came out with a plan in mid-1991, under which companies that significantly cut toxic air emissions earlier than required by the Clean Air Act amendments could get compliance extensions on further pollution controls. And EPA administrator William Reilly developed the Industrial Toxics Project. Under this program, companies that emit any of 17 high-priority toxic chemicals (including chloroform) to water, land, or air are being encouraged to voluntarily cut those emissions 50% by 1995 from baseline levels in 1988.

SOLID WASTE. Solid wastes produced by U.S. pulp and paper mills exceed 12 million tpy, with most being dewatered primary and biological sludges that traditionally have been landfilled, though incineration, conversion to useful products, and land application are becoming more popular. In 1991, EPA proposed regulations on land application of sludge generated by pulp and paper mills that use chlorine or chlorine derivatives for bleaching. EPA may also put forward regulations for landfill and surface impoundment of sludge.

In a modification of the Resource Conservation & Recovery Act (RCRA)—which covers hazardous and solid waste management, cleanup of contamination, and conservation of material and energy—the method used to determine whether waste should be treated as hazardous or not was changed in September 1990 and will likely result in more waste being considered hazardous. In addition, the current list of chemicals whose presence above a specified level puts a waste in this category was extended. Chloroform was among the newly included chemicals. In mid-1990, EPA also came up with standards for treating waste prior to land disposal for the remainder of a group of hazardous substances listed under RCRA, as well as five new wastes—including a dioxin waste. The regulations are being phased in from 1990 to 1992. Congress is expected to take on RCRA reauthorization this year.

CANADA. In Canada, the regulatory situation has been confused for years, with individual provinces setting up their own pollution standards and policies. To "even out the playing field" across the country, Canada recently set out to develop national pollution standards for pulp and paper mills.

In April 1990, Environment Canada issued proposed standards that were due to be finalized in mid-1991 and that, if approved, would be fully implemented by 1994. (Plants in unusual circumstances might be able to arrange for an extension.) Among the proposals were Canadian Environmental Protection Act regulations that would require modification of the pulp bleaching process to prevent the formation of dioxins and furans. In addition, an update of the Fisheries Act would modify effluent discharge limits through the use of new measurement procedures and would require all mills to meet standards on suspended solids, oxygen-depleting substances, and acutely lethal effluents. Canada and the U.S. finally overcame their differences over acid rain issues and signed an air pollution agreement early in 1991 to cut emissions of sulfur dioxide and nitrogen oxide over the next several years. ■

Capital Spending Plans: 1991-93

Excess capacity from the recent expansion boom and continued weakness in the economy will force more cutbacks in spending

By CARL ESPE, News Editor

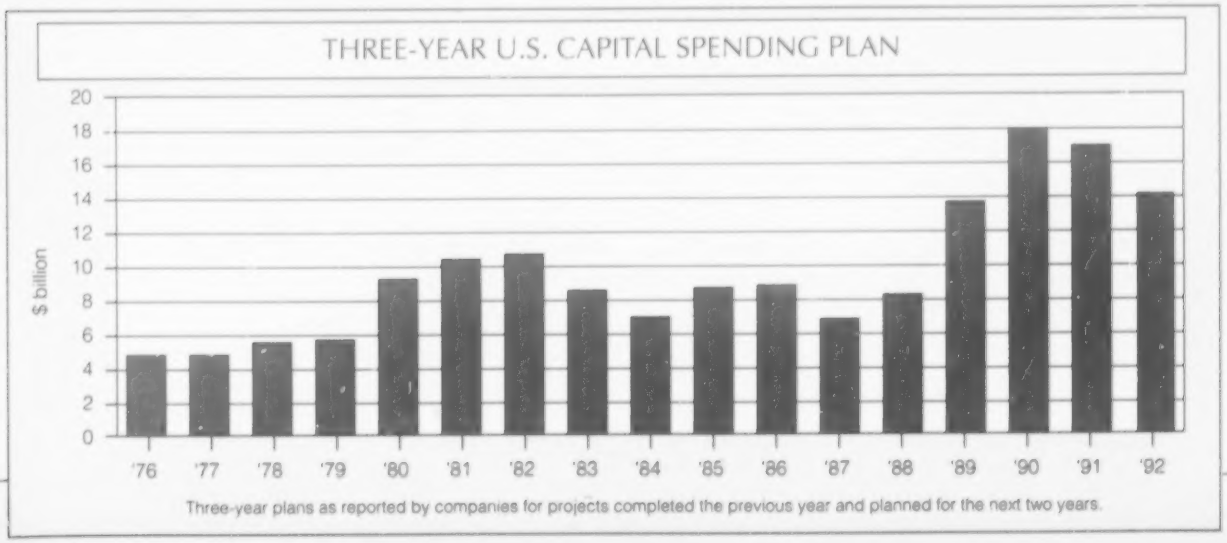
Pulp and paper companies in the U.S. and Canada will cut back sharply on capital spending this year in the face of continued weakness and uncertainty in the economy, stubbornly low prices for major grades, and excess capacity from the expansion boom that peaked last year. The cyclical downturn that first cut into industry profits in 1989 continues today, despite indications that the actual recession that began in 1990 played itself out in early 1991. Capital spending traditionally lags behind a recovery in earnings, so even if the economy picks up later this year, as many analysts expect, 1992 will almost certainly be a down year for investment.

In *Pulp & Paper*'s annual year-end survey of spending, U.S. companies reported plans to spend $14.0 billion on mill improvements over the 1991-93+ period, down 17.7% from plans reported at this time last year for the 1990-92 period. Canadian pulp and paper companies now report plans to spend C$8.9 billion on mill improvements over the 1991-93 period, down 12.1% from plans reported last year for 1990-92. While smaller than the percentage decline in U.S. spending plans, these new Canadian cutbacks come on the heels of a 21.1% decline last year. The economic downturn has been exacerbated in Canada by companies' dependence on hard-hit market pulp and newsprint and by a strong Canadian dollar that cuts into sales recorded in U.S. dollars.

Projects completed in 1991 account for $6.1 billion of the U.S. spending total. So far, announcements total $2.5 billion for projects to be completed in 1992, $4.0 billion for 1993, and $1.1 billion for 1994. Projects completed in 1991 account for C$3.1 billion of the Canadian total. So far, companies have announced plans to spend C$2.0 billion on projects for startup in 1992, C$3.3 billion in 1993, and C$418 million in 1994 and beyond.

The backlog of "proposed" projects—under active consideration, but not yet approved—has declined to $6.7 billion in the U.S., down almost 28% from last year. The drop-off reflects the cancellation of a number of major expansion plans and difficulty in obtaining financing for projects not backed by major industry players. The backlog that remains still includes several speculative projects that are unlikely to advance during the current slump. Mechanical pulp mill proposals in particular appear unlikely to proceed because of weak markets. Proposed projects in Canada account for a potential C$5.7 billion in new spending, down 29% from last year's backlog of C$8.0 billion. As in the U.S., however, this total includes several projects that are unlikely to be approved anytime soon.

While investment plans are definitely being scaled back, it is worth noting that spending will remain very high in historical terms. Outlays planned in the U.S. for 1991-93 are still almost twice as high as they were for 1987-89, just four years ago, and over 30% greater than 1981-83, the peak of the last capital spending cycle. While the year-over-year percentage figures are down,



Three-year plans as reported by companies for projects completed the previous year and planned for the next two years.

spending remains high in absolute terms. And with the relatively high spending plans reported for 1993 and 1994, companies appear poised to push spending higher when the economic cycle turns up again.

EXPANSION GIVING WAY TO ENVIRONMENT. With the largest expansion boom in history now playing out, environmental improvements have replaced capacity additions as the driving force behind spending plans. Environmental programs account for 13.8% of total spending plans reported by U.S. companies, up from 11.1% last year and 6.9% in 1989. In Canada, environmental projects account for 33.5% of planned outlays, up from 24.9% this time last year, 15.9% at the beginning of 1990, and just 5.5% the year before that. Most of this dramatically increased spending will go toward reducing dioxin formation, installing secondary treatment facilities, and controlling odor at kraft pulp mills.

Capacity expansion will retreat in 1992 from the record pace of 1991. Looking ahead, capacity growth will be strongest in recycled grades, including tissue, newsprint and containerboard. Deinked pulp installations are booming thanks to legislated demand for recycled-content papers, and the major tissue producers are gearing up for a period of above-average capacity expansion. The American Paper Institute reports that over the next three years, U.S. pulp and paper companies will add 2.5 million tons of new pulp capacity and 4.9 million tons of paper and paperboard, an average annual growth rate of 1.9%. This compares to growth rates of 3.0% in 1991 and 2.7% in 1990.

Record capacity expansion is the main reason investment plans shot through the roof in 1990, and why they remained relatively high in 1991. With the end of the boom, however, spending will drop as well. Planned outlays for new paper machines in the U.S. totaled $3.2 billion in this year's survey, down 30.5% from last year. Spending plans for new mills dropped from $3.1 billion in last year's survey to $2.7 billion this year, a decline of 14.5%. In Canada, outlays for new paper machines are expected to total just C$751 million over the 1991-93 period, down 43.1% from last year. Spending for new mills will fall 3.6% to C$2.3 billion.

ABOUT *P&P*'S ANNUAL SURVEY. Now in its twenty-eighth year, *P&P*'s annual capital spending survey covers expansion and modernization programs at U.S. and Canadian mills. Unlike surveys that track spending by year, *P&P*'s survey covers spending by project. Dollar figures represent the total cost of reported projects and often include supporting equipment. The total cost of multi-year projects is assigned to the startup year and is not divided among the years of expenditure. Each survey primarily covers a three-year period—the current survey covers 1991-93, but projects with firm startup dates beyond that time frame are also included. ■

UNITED STATES

Environmental programs and increased use of wastepaper are top priorities

■ After two years of record increases, U.S. pulp and paper companies trimmed their capital spending plans in 1991 in the face of deteriorating profits and sluggish growth. Companies invested heavily during the late 1980s to expand capacity, cut costs, improve product quality, and meet environmental standards, but the spending boom peaked in 1990 as the economy slid into recession.

U.S.—REPORTED CAPITAL EXPENDITURES FOR 1991-93+ BY REGION AND TYPE OF IMPROVEMENT ($000)

PRODUCTION-RELATED EXPENDITURES

	WOOD/FIBER		PULPING		NEW MACHINES		REBUILDS		ENERGY		MISC./PLANT	
New England	$0	0%	$275,625	5%	$0	0%	$53,750	4%	$40,750	4%	$44,125	10%
Mid-Atlantic	0	0%	165,400	3%	63,750	2%	46,770	4%	81,375	7%	7,775	2%
East North Central	4,000	1%	376,586	7%	581,030	18%	222,046	17%	346,950	32%	87,554	19%
West North Central	0	0%	11,475	0%	42,075	1%	30,300	2%	32,240	3%	66,610	15%
South Atlantic	62,250	23%	1,683,523	29%	1,131,933	35%	367,120	28%	214,700	20%	111,485	25%
East South Central	89,000	33%	1,680,540	29%	640,550	20%	237,750	18%	137,043	12%	47,817	11%
West South Central	117,950	43%	644,800	11%	344,400	11%	310,500	24%	208,700	19%	68,650	15%
Mountain/Pacific	0	0%	871,353	15%	443,500	14%	31,000	2%	39,100	4%	17,250	4%
Total	**273,200**		**5,709,302**		**3,247,238**		**1,299,236**		**1,100,858**		**451,266**	

	ENVIRONMENTAL QUALITY SPENDING						TOTALS					
	WATER		AIR		SOLID WASTE		PRODUCTION		ENVIRONMENTAL		GRAND TOTAL	
New England	$45,570	3%	$10,080	2%	$9,150	13%	$414,250	3%	$64,800	3%	$479,050	3%
Mid-Atlantic	46,512	3%	22,313	5%	4,500	6%	365,070	3%	73,325	4%	438,395	3%
East North Central	181,675	13%	34,095	7%	10,570	14%	1,618,165	13%	226,340	12%	1,844,505	13%
West North Central	6,480	0%	6,480	1%	3,540	5%	182,700	2%	16,500	1%	199,200	1%
South Atlantic	417,955	30%	104,155	21%	20,240	28%	3,571,010	30%	542,350	28%	4,113,360	29%
East South Central	305,447	22%	141,472	29%	12,981	18%	2,832,700	23%	459,900	24%	3,292,600	23%
West South Central	84,400	6%	127,400	26%	10,250	14%	1,695,000	14%	222,050	11%	1,917,050	14%
Mountain/Pacific	285,600	21%	46,600	9%	1,800	2%	1,402,203	12%	334,000	17%	1,736,203	12%
Total	**1,373,639**		**492,595**		**73,031**		**12,081,098**		**1,939,265**		**14,020,363**	

The recession continues to take its toll on capital spending plans, despite signs that the economy may already have started to rebound. Earnings and capacity utilization remain down sharply in the paper industry, forcing the decline in capital spending.

U.S. pulp and paper companies devoted an increasing portion of their funds to capital improvements during the 1980s, both to increase capacity and to reduce costs and improve their products in order to remain competitive. In absolute terms, spending climbed from $5.24 billion in 1979 to $15.69 billion in 1989, an increase of 200%. Capital spending rose from 86% of cash flow in 1978 and 93% in 1979 to well above 100% of cash flow throughout most of the 1980s. To help pay for this increase, companies boosted their long-term debt significantly from $10.08 billion in 1978 to $33.19 billion in 1989.

Solid evidence for the current slowdown began to appear early in 1990 as companies lowered their capital plans. In late 1989, the industry reported plans to spend $17.92 billion on capital projects in 1990, according to the Bureau of Census. In April 1990, however, that figure had fallen by about $200 million, or 1.1%, from the earlier forecast. A downward revision of 5.1% in planned outlays for the second quarter was responsible for the decline. Further downward revisions followed as the industry responded to slower growth in demand, excess capacity in some grade segments, and reduced profitability.

Despite the slowdown, capital spending still managed to set a new record in 1990 of $16.53 billion, and paper producers were responsible for the largest percentage increase in capital spending among major U.S. manufacturing industries. In percentage terms, however, the 7.3% increase for paper industry spending in 1990 was down sharply from the 42.7% increase seen in 1989.

Pulp and paper producers revised their spending plans downward throughout 1991. In September 1991, the Census Bureau found that the U.S. paper industry planned to cut back new plant and equipment spending to $11.93 billion, down 5.3% from plans reported in June. Spending during the first quarter was revised upward by 1.0%, but second-quarter spending came in 9.9% lower than previously expected, and the forecast for the second half was down 3.5% for third-quarter outlays and 8.8% for the final quarter.

On an annualized basis, spending was forecast at a rate of $11.68 billion in the third quarter and $11.47 billion in the fourth quarter. Since the final quarter is usually the strongest period, the 1.8% decline expected in 1991's final quarter underlines the weakness of current spending plans.

If spending does come in at $11.93 billion for 1991, it would represent a drop of 27.8% from the 1990 total of $16.53 billion, the largest percentage drop by far of any industry group. Overall, U.S. industries planned a 0.5% increase in capital outlays in 1991, with the manufacturing sector down 3.3%.

SPENDING PLANS: 1992 AND BEYOND. *Pulp & Paper*'s late 1991 survey of spending plans for the 1991-93 period confirms the slowdown in spending that began in 1990. U.S. companies report plans to spend $14.0 billion on projects for completion during the 1991-93 period, down 17.7% from plans reported last year for 1990-92. Production-related expenditures total $12.1 billion for 1991-93, down 20.2% from last year's survey.

The capacity expansion boom that drove spending plans to record levels in the late 1980s played itself out in 1991, leaving environmental improvements as the main engine of capital spending. Environmental outlays planned for the 1991-93 period total $1.9 billion, up 2.7% from last year. Environmental projects account for 13.8% of total spending plans, up from 11.1% in 1991 and 6.9% in 1990. Mills will be scrambling to comply with stricter regulations covering dioxin formation, odor control, and recycled-fiber content.

Virtually all of the major capacity additions in newsprint and uncoated free-sheet have been completed, and capacity growth will be strongest for the next couple of years in the recycled grades, including tissue, newsprint

NEW U.S. MILL PROJECTS
(short tons)

STARTED UP IN 1991

Alabama Pine Pulp, Perdue Hill, Ala.
1,250-metric-tpy market bleached softwood kraft pulp

Kimberly-Clark, Loudon, Tenn.
Commercial and industrial tissue mill

APPROVED OR UNDER CONSTRUCTION

Fox River Fiber, De Pere, Wis. **1992**
200-tpd market deinked pulp plant

Lin-Pac, Gaffney, S.C. **1992**
250-tpd "mini-mill" to produce recycled containerboard

Mi Ho, St. Joseph, Mo. **1992**
Recycled coated and uncoated fine paper mill

Shelby Tissue, Memphis, Tenn. **1992**
100-tpd bathroom tissue mill

American Power Recyclers, Barrackville, W.Va. **1993**
400-tpd market deinked pulp mill

Caithness King, Pejepscot, Maine **1993**
550-tpd deinked market pulp mill

Inland Container, Maysville, Ky. **1993**
600-tpd recycled containerboard; Tampella machine

Ponderosa Fibres, Albany, N.Y. **1993**
New mill with capacity for 300 tpd of recycled newsprint

Ponderosa Fibres, New York, N.Y. **1994**
New 300-tpd recycled newsprint mill, expandable to 600 tpd

Scott Paper, Owensboro, Ky. **1993**
Directors have approved initial steps for new tissue mill and converting operation

PROPOSED (NO STARTUP DATE)

Dunkirk Containerboard, Dunkirk, N.Y.
250,000-tpy recycled containerboard mill

Formosa Chemicals, Wallace, La.
Proposed 1,000-metric-tpd dissolving pulp mill and rayon plant

MacMillan Bloedel, Turlock or West Sacramento, Calif.
Studying feasibility for a 284,000-metric-tpy recycled news mill

Northampton Paperboard, Northampton, Pa.
300,000-tpy recycled paperboard

Jefferson Smurfit, Unspecified, N.Y.
250,000-metric-tpy recycled newsprint mill

and containerboard. Deinked pulp installations are booming thanks to legislated demand for recycled-content papers, and the major tissue producers are gearing up for a period of above-average capacity expansion.

One effect of the recession has been to push back spending into future years. While only a few major projects have been canceled outright, over twenty have been postponed, including new paper machine installations planned by Boise Cascade Corp., Westvaco Corp., Federal Paper Board Co., and Weyerhaeuser Paper Co. Spending plans for 1991 were largely locked in when the downturn started, since most projects were either completed in the first half or under way for completion in the second half, but projects planned for the future have been pushed back from 1992 into 1993 and beyond. Projects completed in 1991 account for $6.1 billion of the U.S. spending total. Announcements through late 1991 totaled $2.5 billion for 1992 startups, $4.0 billion for 1993, and $1.4 billion for 1994-95.

Among U.S. companies with the largest capital programs are International Paper Co., Champion International Corp., and Weyerhaeuser. While specific spending amounts are not available, Procter & Gamble Co. has announced plans for a major expansion of its toilet tissue and paper towel business. Temple-Inland Inc. is another company that is gearing up for a major round of mill improvements, focusing on recycled containerboard grades.

Since purchasing Great Northern Nekoosa Corp. in 1990, Georgia-Pacific Corp. has been working to reduce debt incurred in the acquisition as rapidly as possible. Analysts report that G-P management is determined to keep capital spending as low as possible during this period, somewhere in the $400- to $500-million range required to cover annual maintenance costs. G-P's most recent move was to sell an 80% interest in its Northern Paper Div. operations in Millinocket, Maine, to Bowater Inc. for $300 million. Bowater will proceed with installation of a deinking plant begun by G-P and is considering future plans for the Millinocket complex that could include a new lightweight coated paper machine.

James River Corp. announced a major reorganization in August 1990 that will lead to sweeping changes in the company's structure. One consequence of the restructuring will be an increase in capital spending to expand the company's core businesses. James River has been forced by the weak economy to stretch out many of these changes, however, including new paper machines slated for the Old Town, Maine, and Naheola, Ala., mills.

SPENDING BY AREA. Projects to combat water pollution remain the industry's highest environmental priority, particularly to limit dioxin formation at bleached kraft pulp mills. Spending plans for water quality improvements total $1.4 billion for the 1991-93 period, or 71% of overall environmental investment, while spending plans total $493 million for air quality improvements and $73 million for solid waste management. These figures are quite conservative since a significant portion of pulp mill spending is, in fact, driven by environmental considerations.

Pulp mill expansion and modernization projects captured the largest share of spending in this year's survey, despite a drop of 7.4% from last year's survey. Mills reported plans to spend $5.7 billion on pulping projects during the 1991-93 period, or 47% of overall spending. Pulp mill spending accounted for 41% of total outlays in

NEW PAPER MACHINES IN THE U.S. AT EXISTING MILL SITES (short tons)

STARTED UP IN 1991

Fort Howard, Rincon, Ga.
250-tpd, 270-in. Beloit machine—recycled tissue
Georgia-Pacific, Ashdown, Ark.
325,000-tpy, 4,000-fpm Beloit—uncoated free-sheet
North Pacific Paper, Longview, Wash.
230,000-metric-tpy Beloit Bel Baie III—newsprint
Union Camp, Savannah, Ga.
460,000-tpy, 363-in. Valmet kraft linerboard machine
Union Camp, Eastover, S.C.
240,000-tpy, 372-in. Beloit machine—uncoated free-sheet

APPROVED OR UNDER CONSTRUCTION

Consolidated Papers, Wisconsin Rapids, Wis. **1992**
212,000-tpy, 285-in. fourdrinier—coated free-sheet
Kimberly-Clark, Loudon, Tenn. **1992**
Quality recycled bath tissue machine
Potlatch, Lewiston, Idaho **1992**
204-in.-trim, 6,500-fpm Valmet Performer—tissue
Champion, Courtland, Ala. **1993**
240,000-tpy Beloit Bel Baie III machine—uncoated free-sheet
Fort Howard, Green Bay, Wis. **1993**
Beloit 271-in. machine—tissue
Procter & Gamble, eastern U.S. **1993**
Two new machines at mills east of the Rockies—tissue
Westvaco, Covington, Va. **1993**
350,000-tpy Voith machine—bleached paperboard
Appleton Papers, Combined Locks, Wis. **1994**
New No. 7 machine, replacing older unit—carbonless paper
Hammermill, Selma, Ala. **1994**
300,000-tpy uncoated free-sheet

PROPOSED (NO STARTUP DATE)

Bowater, East Millinocket, Maine
Proposed LWC expansion may include new paper machine
Federal Paper Board, Augusta, Ga.
To produce 650 tpd of either bristols or uncoated free-sheet
Fort Howard, Muskogee, Okla.
Potential sites for new recycled tissue machine
Gulf States Paper, Demopolis, Ala.
Bleached paperboard machine; mid-1990s target
James River, Pennington, Ala.
New tissue machine, delayed from 1993 target
James River, Old Town, Maine
New tissue machine, delayed from 1993 target
Orchids Paper Products, La Palma, Calif.
Considering addition of another new tissue machine
Procter & Gamble, western U.S.
Considering new machine for West Coast location—tissue
Riverwood International, West Monroe, La.
Considering 800-1,000-tpd SUS coated board machine
Smurfit Newsprint of California, Pomona, Calif.
230,000-metric-tpy machine—recycled newsprint
Weyerhaeuser Paper, Springfield, Ore.
1,000-tpd linerboard machine, replacing older unit

the 1990 survey and 38% the year before.

Capacity expansion, environmental upgrading, and cost reduction are the three most important factors in current pulp mill spending plans. Mills have been expanding both market pulp capacity and captive pulp capacity to support more paper and paperboard production. Environmental improvements center on odor control and on reducing chlorine use to limit dioxin formation.

High prices and tight markets made market pulp capacity expansion the driving force behind pulp mill spending in the late 1980s, leading to a number of expansion projects that came online in 1991 and 1992. Several of these mills did not previously produce market pulp.

In late 1991, Parsons & Whittemore Inc. completed construction of a new $700-million bleached softwood kraft market pulp mill at Claiborne, Ala. The Alabama Pine Co. mill will have capacity for 1,250 metric tpd. Stone Container Corp.'s Port Wentworth, Ga., mill started up a new 740-tpd bleached hardwood kraft market pulp mill as part of a $335-million modernization, and Union Camp Corp. completed a 105,000-tpy market pulp facility in its $675-million expansion program at Eastover, S.C. Potlatch Corp. plans a new oxygen delignification system and single pulp line, adding 45,000 tpy to bleached kraft pulp capacity at Lewiston, Idaho, at a cost of $105 million.

A $408-million modernization at Champion International's Courtland, Ala., mill included 250,000 tpy of new bleached kraft pulp capacity, setting the stage for the reinstatement of plans to install a new 240,000-tpy uncoated free-sheet paper machine for startup in 1993.

Faced with a solid waste problem that threatens to grow to crisis proportions, more than a dozen states are considering, or have already passed laws mandating, increased use of recycled fiber in newsprint and other paper grades. This situation has led to a boom in secondary-fiber expansion projects and proposals, as paper producers scramble to position themselves for what promises to be a very different market. At least 14 newsprint producers in the U.S. are planning to add deinking facilities over the next three years.

While virgin newsprint is suffering the effects of overcapacity, there could be a shortage of recycled newsprint over the next few years. Virtually all North American newsprint producers not using any secondary fiber currently are seriously considering some type of expansion into recycled newsprint—including those that are far away from wastepaper sources, such as Bowater's East Millinocket, Maine, mill. Alabama River Newsprint Co., which came online in summer 1990, is installing a 360-metric-tpd deinking plant at a cost of $55.6 million to allow production of 40% recycled-content newsprint. Smurfit Newsprint Corp. has approved plans to build a new 255,000-metric-tpy recycled newsprint mill in New York, but the company has not yet announced the location. Inland Container Corp. is building a new $176-million recycled containerboard mill for startup in Maysville, Ky., in 1993, and new recycled paperboard mills have been proposed for the Northeast by Dunkirk Containerboard in New York and Northampton Paperboard in Pennsylvania. On the West Coast, North Pacific Paper Corp. installed a new newsprint machine at Longview, Wash., that includes a deinking facility capable of supplying 25% of overall mill needs.

Spending for paper machine modifications and improvements is down 47% from last year's survey, another victim of slower capacity growth and the economic downturn. Announced spending plans for scheduled rebuild projects total $1.3 billion for the 1991-93 period, or 11% of overall production-related expenditures.

U.S. mills report plans to spend $1.1 billion on power plant improvements during the 1991-93 period, about 10% of total production expenditures and an increase of 4.5% over last year's plans. Cogeneration plants have become the major focus of energy spending. In many cases, these plants are being built, owned, and operated by outside contractors; the mill simply supplies fuel for the plant and takes the power generated. Because of such arrangements, interest in this type of project remains strong, despite lower energy prices.

CANADA—REPORTED CAPITAL EXPENDITURES FOR 1991-93+ BY REGION AND TYPE OF IMPROVEMENT (C$000)

	PRODUCTION-RELATED EXPENDITURES											
	WOOD/FIBER		PULPING		NEW MACHINES		REBUILDS		ENERGY		MISC./PLANT	
Maritimes	$23,405	9%	$22,124	1%	$0	0%	$75	0%	$150	0%	$15,710	5%
Quebec	3,930	2%	744,593	22%	287,282	38%	330,169	53%	37,555	7%	96,703	28%
Ontario	4,870	2%	752,088	22%	245,000	33%	187,695	30%	42,030	8%	4,029	1%
Central	26,400	10%	203,280	6%	0	0%	2,000	0%	26,400	5%	9,920	3%
West	202,070	78%	1,680,443	49%	218,755	29%	99,202	16%	445,686	81%	219,322	63%
Total	**260,675**		**3,402,528**		**751,037**		**619,141**		**551,821**		**345,684**	

	ENVIRONMENTAL QUALITY SPENDING						TOTALS					
	WATER		AIR		SOLID WASTE		PRODUCTION		ENVIRONMENTAL		GRAND TOTAL	
Maritimes	$39,084	2%	$42,362	6%	$1,967	1%	$61,464	1%	$83,412	3%	$144,876	2%
Quebec	324,362	15%	36,935	6%	24,239	14%	1,500,232	25%	385,537	13%	1,885,768	21%
Ontario	119,276	6%	23,176	4%	5,424	3%	1,235,712	21%	147,876	5%	1,383,588	16%
Central	39,600	2%	23,100	4%	3,500	2%	268,000	5%	66,200	2%	334,200	4%
West	1,673,553	76%	526,368	81%	142,950	80%	2,865,478	48%	2,306,871	77%	5,172,349	58%
Total	**2,199,875**		**651,940**		**178,080**		**5,930,886**		**2,989,896**		**8,920,781**	

NEW MILLS AND MACHINES. New paper machines account for 27% of announced spending plans for the 1991-93 period. Planned outlays of $3.2 billion are down 30.5% from last year. New paper machine announcements climbed dramatically in the late 1980s, and now 14 new machines at existing mills and another 8 machines at new mills are scheduled for startup during the 1991-94 period. The most active grades for new machines are tissue, coated and uncoated free-sheet papers, recycled and kraft paperboard, and newsprint.

Union Camp's $375-million modernization and expansion at Savannah, Ga., replaced two older units with a new kraft linerboard machine in 1991. Union Camp completed a $700-million expansion in 1991 that includes a new paper machine at its Eastover, S.C., mill. Also in 1991, Georgia-Pacific completed a $500-million expansion at Ashdown, Ark., adding 325,000 tpy of uncoated free-sheet paper capacity.

Early this year, Consolidated Papers Inc. will complete installation of a new $400-million coated free-sheet machine at the Wisconsin Rapids Div. Boise Cascade announced plans for a new $450-million coated groundwood expansion at Rumford, Maine, targeted for completion in late 1993, but the project has been deferred due to poor market conditions.

Kimberly-Clark Corp. started up a new mill in 1991, at Loudon, Tenn., and is already expanding the facility with another machine scheduled for startup in 1992. Fort Howard Corp. installed a fourth recycled tissue machine in 1991 at Rincon, Ga., and the company has announced plans for new capacity at Muskogee, Okla., and Green Bay, Wis. Procter & Gamble Co. plans to install two new tissue machines at mills east of the Rockies by 1993. The company is also studying expansion opportunities on the West Coast that could include another machine or even a new mill.

The latest new machine announcement is by Appleton Papers Inc., which plans to install a new $170-million carbonless and thermal basestock paper machine at Combined Locks, Wis., for startup in 1994. Also targeted for 1994, International Paper's Hammermill Papers unit has reported plans for adding new capacity at Selma, Ala.

Ponderosa Fibres of America Inc. has moved aggressively into recycled newsprint with plans for two mills in New York State, one in New York City and one in Albany. Deinked market pulp mills are planned by several smaller companies, including Caithness King, Fox River Fiber, and American Power Recyclers. Only Fox River Fiber's 200-tpd plant in De Pere, Wis., is under construction at this time, however, with startup scheduled for this year. ■

NEW PAPER MACHINES IN CANADA
FOR INSTALLATION AT EXISTING MILL SITES
(metric tons)

STARTED UP IN 1991

Atlantic Packaging, Whitby, Ont.
150,000-tpy Voith recycled newsprint machine
Canadian Pacific, Thunder Bay, Ont.
240,000-tpy, 362-in. Valmet machine, replacing two—newsprint
Kruger, Trois Rivieres, Que.
180,000-tpy, 300-in.-trim Beloit machine—newsprint
Perkins Papers, Candiac, Que.
48,500-short-tpy Valmet machine—recycled tissue
Stone-Consolidated, Grand'Mere, Que.
183,000-tpy machine, replacing two older units—groundwood specialties

PROPOSED (NO STARTUP DATE)

MacMillan Bloedel, Powell River, B.C.
Mill upgrade may include new machine for higher-value grades
Tembec, Temiscaming, Que.
200,000-tpy coated fine paper machine
Vicell Canada Tissue, Delta, B.C.
9,000-tpy dry-form tissue machine

CANADA

Faced with depression-like economic conditions, mills have cut back severely on investment plans

■ The 1990-91 recession hit Canadian pulp and paper companies hard, leading to a sharp drop in capital spending plans for 1991 and prospects for further cuts in 1992. Spending is down for the third straight year, as the industry retrenches in response to lower earnings and severe overcapacity.

In *P&P*'s new spending survey, companies reported plans to spend C$8.9 billion (all dollars are Canadian) on mill projects during the 1991-93 period, down 12.1% from plans reported in January 1990 for the 1990-92 period. These results echo a survey by Statistics Canada that forecast a decline of 12.2% in 1991 outlays, to $3.81 billion. The decline forecast for Canada is smaller than in the U.S., but it comes on top of a 14.8% drop in 1990, when U.S. spending was still rising.

As in the U.S., the capacity expansion boom that drove spending plans to record levels in the late 1980s played itself out in 1991, leaving environmental improvements as the main engine of capital spending. In Canada, outlays for environmental upgrades comprise 34% of planned improvement projects, up from 25% in the January 1991 survey, 16% in 1990, and just 8% in January 1989. New national standards slated for implementation by 1994 will require pulp mill and bleach plant modifications to suppress dioxin and furan formation. Mills are also faced with stricter standards on suspended solids, biological oxygen demand (BOD), and other effluent limits.

The Canadian Pulp & Paper Assn. estimates that the industry must spend approximately $3 billion a year to maintain and upgrade facilities to improve productivity and competitiveness. With markets still very weak, mills will cut back on expansion projects and concentrate their efforts in the environmental arena.

Plans for further pulp capacity increases in Canada have made a bit of a comeback in the face of stiff envi-

ronmental opposition. Alberta-Pacific Forest Industries $1.3-billion kraft pulp mill proposal got the green light in early 1991 after a series of delays that almost killed the project, and Celgar Pulp Co.'s $700-million face-lift at Castlegar, B.C., passed environmental review by a newly formed provincial panel.

Projects completed in 1991 account for $3.1 billion of reported Canadian outlays in the *P&P* survey. Through late 1991, companies had announced plans to spend $2.03 billion on projects for startup in 1992, $3.3 billion in 1993, and $418 million in 1994-95. Proposed projects have been cut back, dropping 27% since last year to $5.6 billion. However, many of these proposals are for greenfield projects which will be hard to finance given current market conditions.

As in the U.S., companies are scrambling to install deinking capacity to meet demand for recycled papers. Abitibi-Price Inc., Boise Cascade Canada Ltd., Bowater Mersey Paper Co., and Stone-Consolidated Inc. have all stated publicly that they are studying plans to incorporate secondary fiber in their newsprint operations. Donohue Inc. and James Maclaren Industries Inc. have proposed a joint-venture facility for Montreal. Cascades Inc., Noranda Forest Recycled Papers and Kruger Inc. are also considering deinking expansions, and Orford Recycling Inc. has proposed a 120,000-metric-tpy (all tons are metric) market deinked pulp mill for Drummondville, Que. Daishowa Forest Products Ltd. announced that it will install a large deinking plant for recycled newsprint and directory paper production at its Quebec City, Que., mill. In western Canada, Fletcher Challenge Canada Ltd. and MacMillan Bloedel Ltd. have agreed to take the output of a new market deinked pulp plant to be built by Newstech Recycling Inc. in Coquitlam, B.C. There are currently no deinking facilities in western Canada.

GEOGRAPHIC BREAKDOWN. During the past decade, the pattern of provincial expenditures has shifted in focus from western Canada to eastern Canada, and then back again. Until 1982, British Columbia and Alberta led the field in total dollar amounts, capacity expansion, and greenfield mill plans. After 1982, spending programs in Ontario and Quebec eclipsed the western provinces. Weak markets and high production costs dealt a heavy blow to British Columbian companies during the recessions of the early 1980s, while in Quebec and Ontario, federal aid designed to modernize the industry helped some eastern companies when the economy forced internal cutbacks. Recently, however, emphasis on capacity expansion has shifted the advantage back to resource-rich western Canada, and the need to improve environmental controls will force major improvements over the next several years at the region's large pulp mills. *P&P*'s survey shows that 58% of planned spending is at western mills.

In the 1991 Statistics Canada survey, mills in British Columbia reported plans to spend $1.3 billion in 1991, down 14.6% from outlays of $1.5 billion in 1990. The decline planned for 1991 follows gains of 5.5% in 1990 and 59.9% in 1989. In Quebec, companies reported plans to spend $1.02 billion in 1991, down 9.6% from 1990 outlays of $1.13 billion. Spending in the "other" provinces of Alberta, Saskatchewan, Manitoba, and the Maritimes was expected to drop 15.3% in 1991 to $793 million. In Ontario, companies reported plans to spend $710 million on capital improvements in 1991, down 7.6% from 1990 spending of $769 million.

HISTORICAL PATTERN. The past ten years have been a roller coaster ride for capital spending in Canada. While efforts during the middle of the past decade were focused on cost containment and productivity improvement, spending plans in the late 1980s were driven mainly by capacity expansion, particularly in newsprint, market pulp, and fine papers. In 1989, newsprint producers began a huge buildup in capacity lasting into 1991. Chemical market pulp producers geared up for a similar glut of new capacity, although some projects were later delayed. Much of this pulp mill spending was funded by overseas interests, particularly the Japanese, who have found North America a cheap place to invest at current exchange rates. More so than in the U.S., capital spending in Canada got a boost from overseas investment. Of ten major expansion programs announced in 1988, five of the largest involved major investments by overseas papermakers.

Entrepreneurial investment has also been a major factor in Canadian spending plans. Led by Repap Inc., companies, such as Cascades and St. Marys Paper Inc., that have rescued and rejuvenated old mills are responsible for a share of spending out of proportion to their size. Another group of entrepreneurs has come in from

NEW CANADIAN MILL PROJECTS
(metric tons)

STARTED UP IN 1991

Howe Sound Pulp & Paper, Port Mellon, B.C.
535-tpy TMP/newsprint mill; Valmet machine
Louisiana-Pacific, Chetwynd, B.C.
157,500-tpy bleached market CTMP

APPROVED OR UNDER CONSTRUCTION

Newstech Recycling, Coquitlam, B.C. **1992**
122,500-tpy market deinked groundwood pulp
Millar Western Pulp, Meadow Lake, Sask. **1992**
240,000-tpy bleached market CTMP mill
Alberta-Pacific Forest Industries, Athabasca, Atla. **1993**
500,000-tpy bleached kraft market pulp

PROPOSED (NO STARTUP DATE)

Consumers Paper, Redcliff, Alta.
25,000-tpy recycled tissue mill
Desencrage CDM, Cap-de-la-Madeleine, Que.
90,000-tpy market deinked pulp mill
Orenda Forest Products, Stewart, B.C.
173,000-tpy machine-finish coated paper mill
Orford Recycling, Drummondville, Que.
122,000-tpy market deinked pulp mill
Shin Ho Canada, Thunder Day, Ont.
150,000-tpy bleached hardwood CTMP mill

outside the industry and built new capacity, especially in the West. Millar Western Pulp Ltd., for example, entered the industry by building a new chemi-thermomechanical market pulp (CTMP) mill in Alberta in 1988, and another mill is slated for 1992 startup in Saskatchewan.

Capacity growth rates have been higher than average in the Canadian industry since 1986, culminating in record expansion plans at the end of the decade. Business conditions began to sour in 1989, but the expansion boom continued to take shape, and in 1990, the industry found itself in the middle of a capacity expansion boom in its major grade segments as well as in a steep market downturn. Capital spending plans plunged, and the three-year outlook for capacity expansion dropped 20%. The expansion boom was originally expected to be much larger than it has turned out to be, although it is still larger than any growth period since the 1970s. Collapsing prices put the squeeze on newsprint companies in 1989, resulting in a series of project cancellations, postponements, shutdowns of high-cost capacity, and conversions to other grades that will continue into 1992.

SPENDING BY CATEGORY. In *P&P*'s late 1991 survey of spending, Canadian companies reported plans to spend $8.9 billion on capital projects during the 1991-93 period, down 12.1% from plans reported in January 1991 for the 1990-92 period. Production-related projects accounted for $5.9 billion of overall spending, down 22.3% from the previous survey. Spending was down in every part of the mill, led by a 43.1% drop in installations of new paper machines. Pulp mill improvements, the largest category in dollar terms, totaled $3.4 billion, down 23.9% from 1991.

Environmental expenditures climbed to $3.0 billion for 1991-93, up 18.5% from plans reported for 1990-92. Spending for water quality improvements posted a 14.1% gain, following increases of 18.9% in 1991, 506% in 1990, and 122% in 1989. Water pollution control spending plans now total $2.2 billion, comprising 72% of overall environmental spending plans. Companies reported air pollution control projects costing $652 million for 1991-93, up 16.0% from last year. Spending for solid waste disposal is up by 162.5% to $178 million, as mills earmark funds for sludge disposal projects.

Pulp mill spending accounts for 57% of current production related spending plans, totaling $3.4 billion. In late 1991, Fletcher Challenge Canada and James River-Marathon Ltd. completed major improvement programs adding 75,000 tpy and 178,500 tpy, respectively. A 235,000-tpy expansion program at Celgar Pulp's Castlegar mill is targeted for completion in mid-1992.

Bleached hardwood kraft pulp capacity will jump 391,000 tpy by 1992 to 1.36 million tons, a substantial 40.4% increase over 1989, according to the Canadian Pulp & Paper Assn. Most of the extra capacity will result from three sources: Daishowa Canada's new Peace River Pulp Co. mill in Peace River, Alta.; James Maclaren Industries' 75,000-tpy expansion at Thurso, Que., in 1990; and Malette Inc.'s 1990-92 modernization program at Smooth Rock Falls, Ont., adding about 70,000 tpy of softwood and hardwood kraft output. Alberta-Pacific has begun construction of its $1.3 billion bleached kraft market pulp mill in Athabasca, Alta. The 500,00-tpy facility is on target for startup in 1993.

Mechanical market pulp has been one of the fastest-growing sectors in Canada, but because of depressed markets, it is unclear exactly how much of the announced new capacity will actually be built. Poor markets have forced the shutdown of two recently opened facilities—Cascades' mill in Port Cartier, Que., and Donohue Matane in Matane, Que. Proposals still on the drawing board are being held back until market conditions improve.

Louisiana-Pacific Corp. completed its new 157,500-tpy bleached CTMP plant in Chetwynd, B.C., in early 1991. Millar Western Pulp is on track to complete its new 240,000-tpy bleached market CTMP plant in Meadow Lake, Sask., early this year. The facility will cost $330 million.

Outlays for new paper machines drop 43.1% in this year's survey to $751 million. No new paper machines are currently under construction in Canada, either at new or existing mills. Spending for paper machine rebuilds has also been hit hard by the economic downturn, dropping 14.5% to $619 million for 1991-93.

Atlantic Packaging Products Ltd. brought a new 150,000-tpy newsprint machine online in early 1991, as did Canadian Pacific Forest Products (CPFP) and Kruger. CPFP's new 240,000-tpy No. 5 machine at Thunder Bay, Ont., will replace two older units for a 60,000-tpy net increase in capacity. Kruger's new machine at Trois Rivières, Que., will have capacity for 180,000 tpy, but about 70,000 tpy of the increase will be offset by conversion of No. 4 machine at Corner Brook, Nfld., to supercalendered paper production.

The final machine to come online in this round of expansions was at Howe Sound Pulp & Paper Co. Ltd.'s new 535-tpd mill at Port Mellon, B.C., which started up in July 1991.

Four new machines will raise sanitary papers capacity by 31.4% to 666,000 tons in 1992. Atlantic Packaging Products, Whitby, Ont., and Irving Tissue Ltd., Saint John, N.B., each added a new machine early in 1990, and a third machine started up in early 1990 at Cascades' Kingsey Falls, Que., mill. In mid-1991, Perkins Paper Ltd. started up a new tissue unit at Candiac, Que. ■

Complete results of P&P's exclusive survey of North American capital spending programs for 1992-93 are available in a separate ***Mill-by-Mill Listings*** *report. Organized by company, the listings show programs for new mills and machines, rebuilds and modernizations, environmental quality control, and other mill improvements, with specifics on equipment ordered, dates, suppliers, and prices, where available. Subscribers to P&P's monthly newsletter, Project Report, receive a free copy of the report with their January issue. All others may obtain a copy of the report for US$145. To order, send payment to Pulp & Paper, Editorial Dept., 600 Harrison St., San Francisco, Calif. 94107.*